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# TEST REPORT

ACCORDING TO: FCC 47CFR part 15 subpart C § 15.247

FOR:

**Ruggedcom Ltd.**  
**pBST base station operating**  
**in 5.8 GHz band**  
**Model: WiN7258**  
**FCC ID:VG5WIN7258**

This report is in conformity with ISO/IEC 17025. The "A2LA Accredited" symbol endorsement applies only to the tests and calibrations that are listed in the scope of Hermon Laboratories accreditation. The test results relate only to the items tested. This test report shall not be reproduced in any form except in full with the written approval of Hermon Laboratories Ltd.

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## 1 Applicant information

**Client name:** Ruggedcom Ltd.  
**Address:** 32 Maskit Street, P.O.Box 12412, Herzeliya 46733, Israel  
**Telephone:** +972 9951 9556  
**Fax:** +972 9951 9557  
**E-mail:** AmnonAssulin@ruggedcom.com  
**Contact name:** Mr. Amnon Assulin

## 2 Equipment under test attributes

**Product name:** Base station operating in 5.8 GHz band  
**Product type:** Transceiver  
**Model(s):** WiN7258  
**Serial number:** 45813712001  
**Hardware version:** RFID =11  
**Software release:** SS4.3.4624.21  
**Receipt date** 9/09/2012

## 3 Manufacturer information

**Manufacturer name:** Ruggedcom Ltd.  
**Address:** 32 Maskit Street, P.O.Box 12412, Herzeliya 46733, Israel  
**Telephone:** +972 9951 9556  
**Fax:** +972 9951 9557  
**E-Mail:** AmnonAssulin@ruggedcom.com  
**Contact name:** Mr. Amnon Assulin





## 4 Test details

**Project ID:** 23642  
**Location:** Hermon Laboratories Ltd. Harakevet Industrial Zone, Binyamina 30500, Israel  
**Test started:** 9/09/2012  
**Test completed:** 10/25/2012  
**Test specification(s):** FCC 47CFR part 15, subpart C §15.247

## 5 Tests summary

Test	Status
<b>Transmitter characteristics</b>	
Section 15.247(a)(2), 6 dB bandwidth	Pass
Section 15.247(b)(3), Peak output power	Pass
Section 15.247(b)5, RF exposure	Pass, exhibit provided in Application for certification
Section 15.247(d), Conducted spurious emissions	Pass
Section 15.247(d), Radiated spurious emissions	Pass
Section 15.247(d), Band edge emissions	Pass
Section 15.247(e), Peak power density	Pass
Section 15.207(a), Conducted emission	Pass
Section 15.203, Antenna requirement	Pass

Testing was completed against all relevant requirements of the test standard. The results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested. Pass/ fail decision was based on nominal values.

	Name and Title	Date	Signature
<b>Tested by:</b>	Mrs. E. Pitt, test engineer Mr. S. Samokha, test engineer	October 25, 2012	 
<b>Reviewed by:</b>	Mrs. M. Cherniavsky, certification engineer	October 30, 2012	
<b>Approved by:</b>	Mr. M. Nikishin, EMC and radio group manager	October 30, 2012	



## 6 EUT description

### 6.1 General information

The EUT, base station of WiMAX system operating in 5.8 GHz band, comprises an Outdoor Unit (ODU) that includes modem, radio, data processing and management components, serving as an efficient platform for a wide range of services. It provides a wireless connection to the subscriber unit.  
 The both EUT antennas are driven incoherently and there is no beamforming gain.

### 6.2 Ports and lines

Port type	Port description	Connected from	Connected to	Qty.	Cable type	Cable length, m
Power	AC power	PoE adapter	AC mains	1	Unshielded	3
Power and telecom	48 VDC + Ethernet	EUT	PoE adapter	1	Shielded	3
RF	Antenna	EUT	Not terminated	2	NA	NA

### 6.3 Support and test equipment

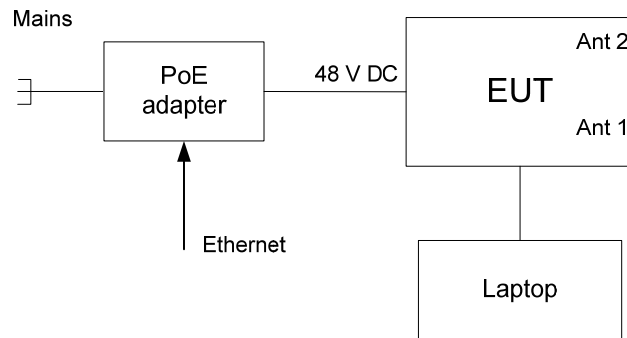
Description	Manufacturer	Model number	Serial number
Laptop	Lenovo	T410	2522WZN
PoE adapter (CPE)	RuggedWireless Ltd.	WiN1010 (0334B4848)	0507047

### 6.4 Changes made in EUT

No changes were implemented in the EUT.



## 6.5 Test configuration





### 6.6 Transmitter characteristics

<b>Type of equipment</b>					
<input checked="" type="checkbox"/>	Stand-alone (Equipment with or without its own control provisions)				
<input type="checkbox"/>	Combined equipment (Equipment where the radio part is fully integrated within another type of equipment)				
<input type="checkbox"/>	Plug-in card (Equipment intended for a variety of host systems)				
<b>Intended use</b>		<b>Condition of use</b>			
<input checked="" type="checkbox"/>	fixed	Always at a distance more than 2 m from all people			
<input type="checkbox"/>	mobile	Always at a distance more than 20 cm from all people			
<input type="checkbox"/>	portable	May operate at a distance closer than 20 cm to human body			
<b>Assigned frequency range</b>		5725.0 – 5850.0 MHz			
<b>Operating frequency range</b>		5728.0 – 5846.0 MHz			
<b>RF channel bandwidth</b>		5 MHz, 10 MHz			
<b>Maximum rated output power</b>		At transmitter 50 Ω RF output connector (total for 2 chains)		26.3 dBm for 5 MHz CBW and for 10 MHz CBW	
<b>Is transmitter output power variable?</b>		<input type="checkbox"/> No			
		<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/> continuous variable	
				<input checked="" type="checkbox"/> stepped variable with stepsize	0.5 dB
				minimum RF power	-21 dBm
				maximum RF power	26.3 dBm
<b>Antenna connection</b>					
<input type="checkbox"/> unique coupling	<input checked="" type="checkbox"/> standard connector	<input type="checkbox"/> Integral	<input checked="" type="checkbox"/> with temporary RF connector <input type="checkbox"/> without temporary RF connector		
<b>Antenna/s technical characteristics</b>					
Type	Manufacturer	Model number	Gain		
Sector dual slant antenna	MTI Wireless Edge Ltd.	MT – 464018/ND (ANTN0074)	16 dBi		
Omnidirectional	MTI Wireless Edge Ltd.	MT-462008/N/A (ANTN0076, N-Female)	9.5 dBi		
<b>Transmitter 99% power bandwidth</b>		5 MHz, 10 MHz			
<b>Type of modulation</b>		QPSK 1/2, 16QAM 3/4, 64QAM 5/6			
<b>Transmitter aggregate data rate/s, Mbps</b>					
Bandwidth, MHz	Direction	QPSK 1/2	16QAM 3/4	64QAM 5/6	
5	DL	4.608	13.824	23.04	
	UL	1.4688	4.4064	7.344	
10	DL	9.216	27.648	46.08	
	UL	3.024	9.072	15.12	
<b>Type of multiplexing</b>		OFDMA			
<b>Modulating test signal (baseband)</b>		PRBS			
<b>Maximum transmitter duty cycle in normal use</b>		75%	<b>Tx ON time</b>	<b>Period</b>	
<b>Transmitter duty cycle supplied for test</b>		60%	<b>Tx ON time</b>	<b>Period</b>	
<b>Transmitter power source</b>					
		<b>Nominal rated voltage</b>	Battery type		
<input checked="" type="checkbox"/>	DC	<b>Nominal rated voltage</b>	48 V (via PoE powered from the mains)		
	AC mains	<b>Nominal rated voltage</b>	Frequency		
<b>Common power source for transmitter and receiver</b>		<input checked="" type="checkbox"/>	yes	no	



<b>Test specification:</b>		<b>FCC section 15.247(a)(2), 6 dB bandwidth</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01	
<b>Test mode:</b>		<b>Verdict:</b>	
Compliance		PASS	
<b>Date(s):</b>		9/12/2012	
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

## 7 Transmitter tests according to 47CFR part 15 subpart C requirements

### 7.1 Minimum 6 dB bandwidth

#### 7.1.1 General

This test was performed to measure 6 dB bandwidth of the EUT carrier frequency. Specification test limits are given in Table 7.1.1.

Table 7.1.1 The 6 dB bandwidth limits

Assigned frequency, MHz	Modulation envelope reference points*, dBc	Minimum bandwidth, kHz
902.0 – 928.0	6.0	500.0
2400.0 – 2483.5		
5725.0 – 5850.0		

\* - Modulation envelope reference points provided in terms of attenuation below the peak of modulated carrier.

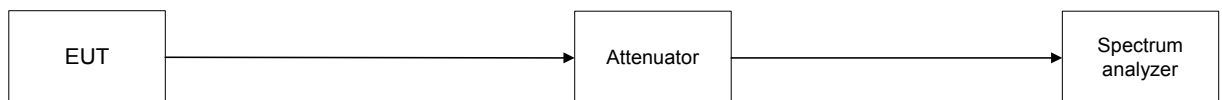
#### 7.1.2 Test procedure

7.1.2.1 The EUT was set up as shown in Figure 7.1.1, energized and its proper operation was checked.

7.1.2.2 The EUT was set to transmit modulated carrier.

7.1.2.3 The transmitter minimum 6 dB bandwidth was measured with spectrum analyzer as frequency delta between reference points on modulation envelope and provided in Table 7.1.2 and the associated plots.

Figure 7.1.1 The 6 dB bandwidth test setup







<b>Test specification:</b>	<b>FCC section 15.247(a)(2), 6 dB bandwidth</b>		
<b>Test procedure:</b>	558074 D01 DTS Meas Guidance v01		
<b>Test mode:</b>	Compliance	<b>Verdict:</b>	<b>PASS</b>
<b>Date(s):</b>	9/12/2012		
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Table 7.1.2 The 6 dB bandwidth test results

ASSIGNED FREQUENCY BAND: 5725-5850 MHz  
 DETECTOR USED: Peak  
 SWEEP TIME: Auto  
 RESOLUTION BANDWIDTH: 100 kHz  
 VIDEO BANDWIDTH: 300 kHz  
 MODULATION ENVELOPE REFERENCE POINTS: 6.0 dBc  
 MODULATING SIGNAL: PRBS

**ANTENNA 1**

CHANNEL BANDWIDTH 5 MHz

Carrier frequency, MHz	6 dB bandwidth, MHz	Limit, kHz	99%OBW	Verdict
<b>QPSK</b>				
5728.0	4593	500	4581.5	Pass
5787.5	4562	500	4596.0	Pass
5846.0	4563	500	4614.0	Pass
<b>64 QAM</b>				
5728.0	4605	500	4596.3	Pass
5787.5	4623	500	4610.4	Pass
5846.0	4532	500	4642.7	Pass

CHANNEL BANDWIDTH 10 MHz

Carrier frequency, MHz	6 dB bandwidth, MHz	Limit, kHz	Margin, kHz	Verdict
<b>QPSK</b>				
5730.5	9206	500	9124.3	Pass
5787.5	9188	500	9104.2	Pass
5844.0	9173	500	9141.6	Pass
<b>64 QAM</b>				
5730.5	9190	500	9119.3	Pass
5787.5	9163	500	9106.2	Pass
5844.0	9160	500	9142.1	Pass



<b>Test specification:</b>	<b>FCC section 15.247(a)(2), 6 dB bandwidth</b>		
<b>Test procedure:</b>	558074 D01 DTS Meas Guidance v01		
<b>Test mode:</b>	Compliance	<b>Verdict:</b>	<b>PASS</b>
<b>Date(s):</b>	9/12/2012		
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Table 7.1.2 The 6 dB bandwidth test results (continued)

**ANTENNA 2**

CHANNEL BANDWIDTH

5 MHz

Carrier frequency, MHz	6 dB bandwidth, MHz	Limit, kHz	99%OBW	Verdict
<b>QPSK</b>				
5728.0	4590	500	4608.9	Pass
5787.5	4607	500	4591.7	Pass
5846.0	4558	500	4643.4	Pass
<b>64 QAM</b>				
5728.0	4605	500	4623.6	Pass
5787.5	4624	500	4609.4	Pass
5846.0	4530	500	4673.9	Pass

CHANNEL BANDWIDTH

10 MHz

Carrier frequency, MHz	6 dB bandwidth, MHz	Limit, kHz	Margin, kHz	Verdict
<b>QPSK</b>				
5730.5	8895	500	9145.4	Pass
5787.5	9188	500	9098.5	Pass
5844.0	9170	500	9159.1	Pass
<b>64 QAM</b>				
5730.5	9128	500	9147.5	Pass
5787.5	9163	500	9100.6	Pass
5844.0	9177	500	9177.0	Pass

**Reference numbers of test equipment used**

HL 3301	HL 3302	HL 3442	HL 3781	HL 3818	HL 3868	HL 3903		
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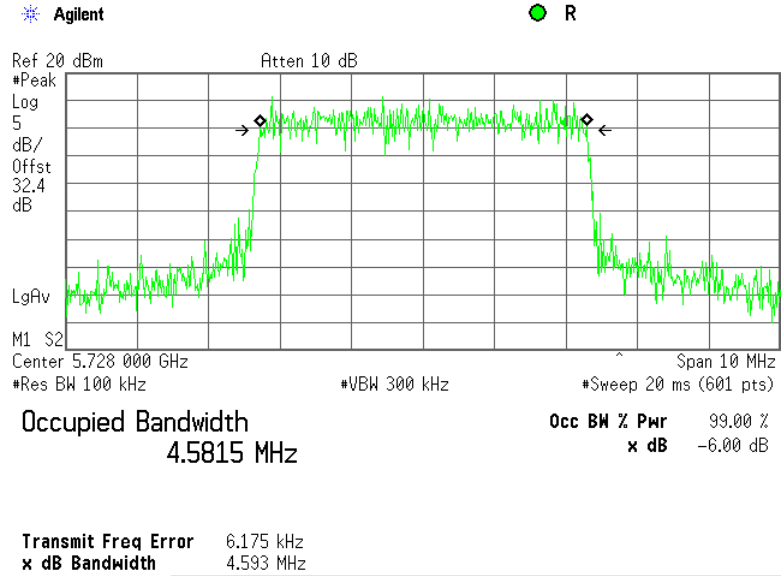
Full description is given in Appendix A.



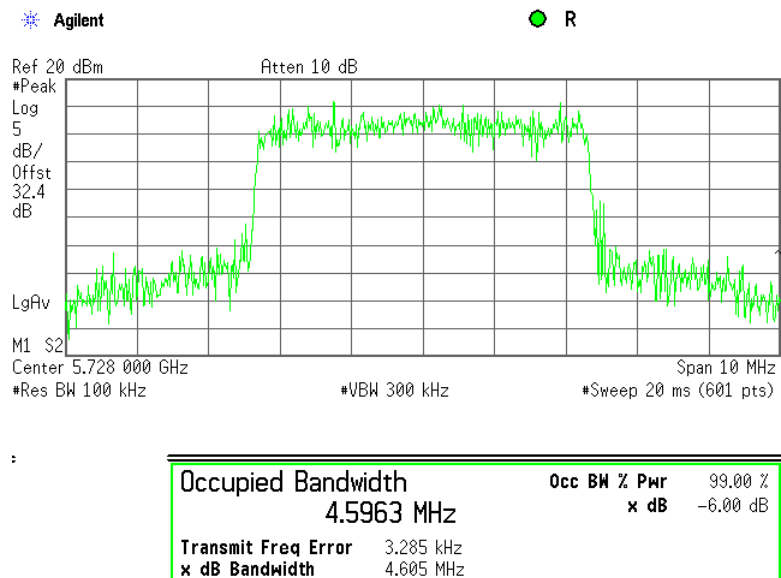
HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(a)(2), 6 dB bandwidth			
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 9/12/2012			
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.1.1 The 6 dB bandwidth test result at low frequency, 5 MHz CBW, QPSK, Antenna 1



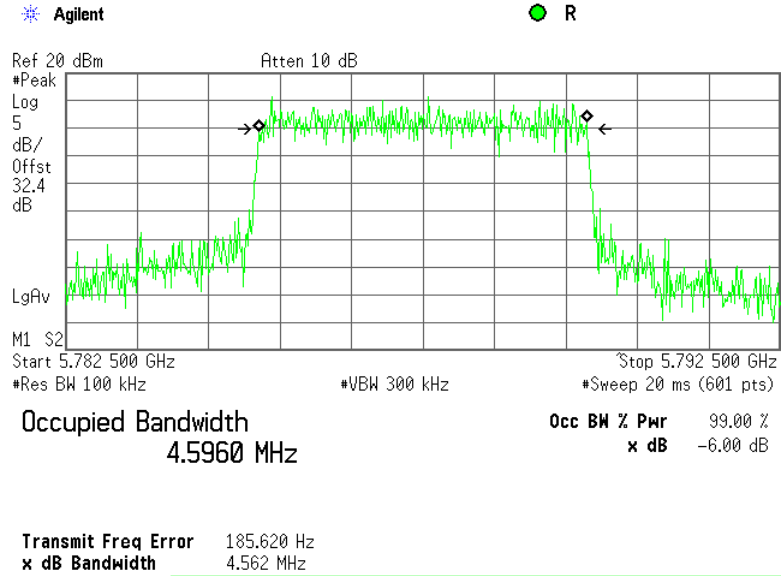
Plot 7.1.2 The 6 dB bandwidth test result at low frequency, 5 MHz CBW, 64QAM, Antenna 1



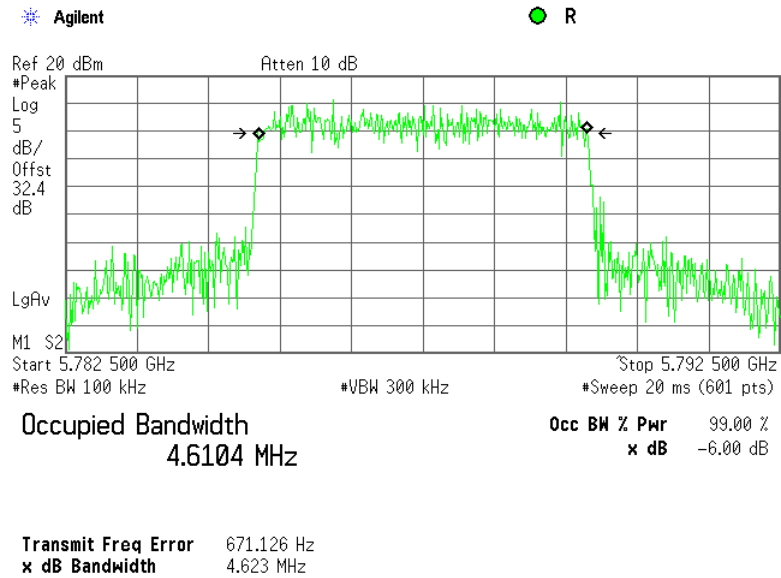


<b>Test specification:</b> FCC section 15.247(a)(2), 6 dB bandwidth			
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 9/12/2012			
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.1.3 The 6 dB bandwidth test result at mid frequency, 5 MHz CBW, QPSK, Antenna 1



Plot 7.1.4 The 6 dB bandwidth test result at mid frequency, 5 MHz CBW, 64QAM, Antenna 1

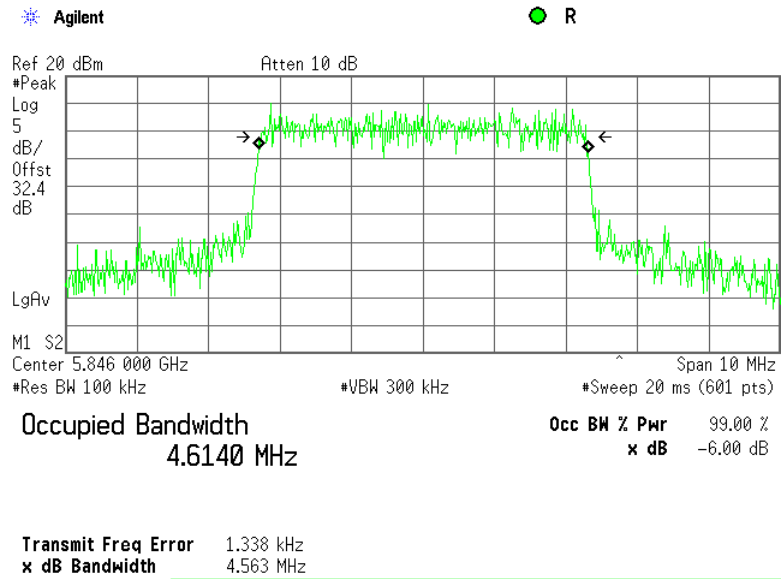




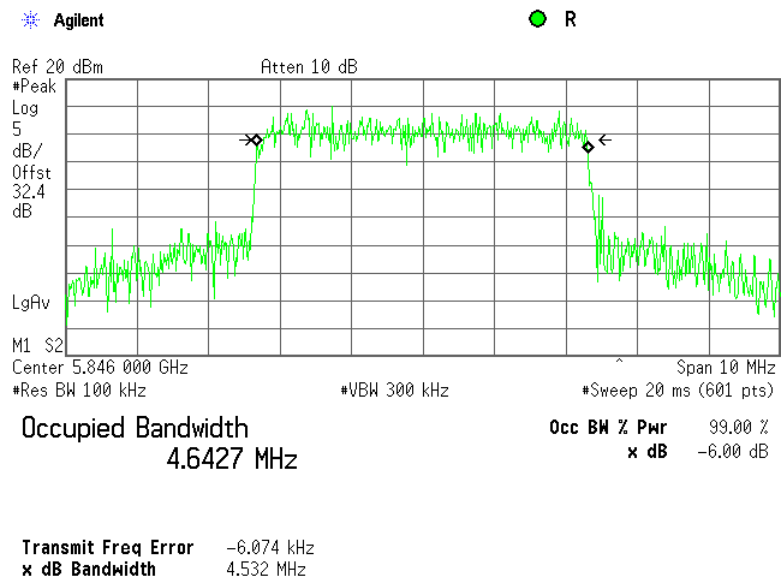
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<b>Test specification:</b> FCC section 15.247(a)(2), 6 dB bandwidth	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 9/12/2012	
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa
	<b>Relative Humidity:</b> 48 %
	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>	

Plot 7.1.5 The 6 dB bandwidth test result at high frequency, 5 MHz CBW, QPSK, Antenna 1



Plot 7.1.6 The 6 dB bandwidth test result at high frequency, 5 MHz CBW, 64QAM, Antenna 1

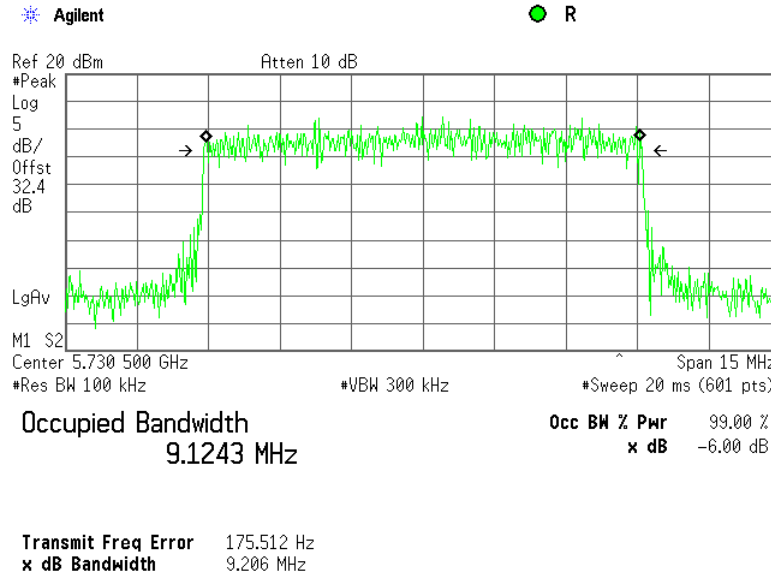




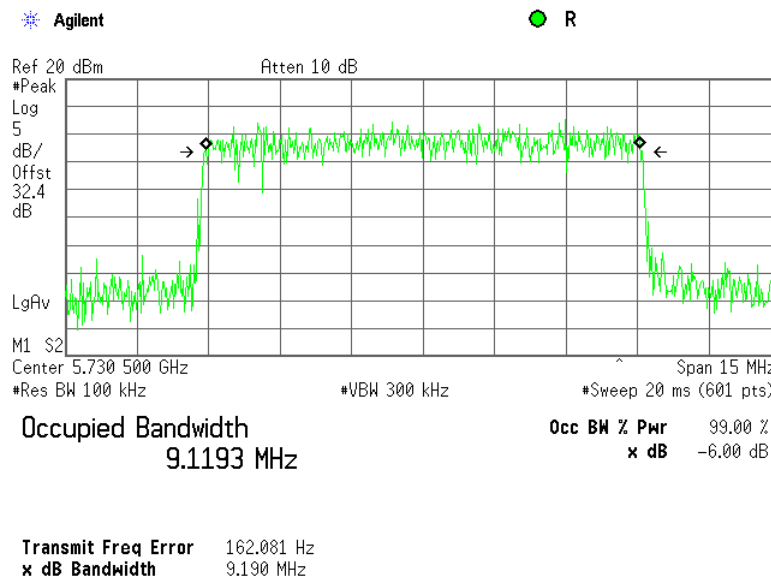
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<b>Test specification:</b> FCC section 15.247(a)(2), 6 dB bandwidth	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 9/12/2012	
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa
	<b>Relative Humidity:</b> 48 %
	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>	

Plot 7.1.7 The 6 dB bandwidth test result at low frequency, 10 MHz CBW, QPSK, Antenna 1



Plot 7.1.8 The 6 dB bandwidth test result at low frequency, 10 MHz CBW, 64QAM, Antenna 1

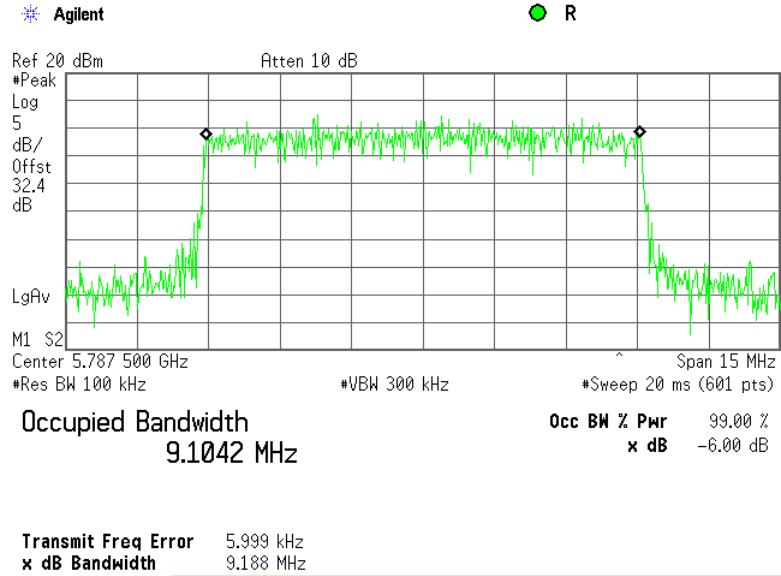




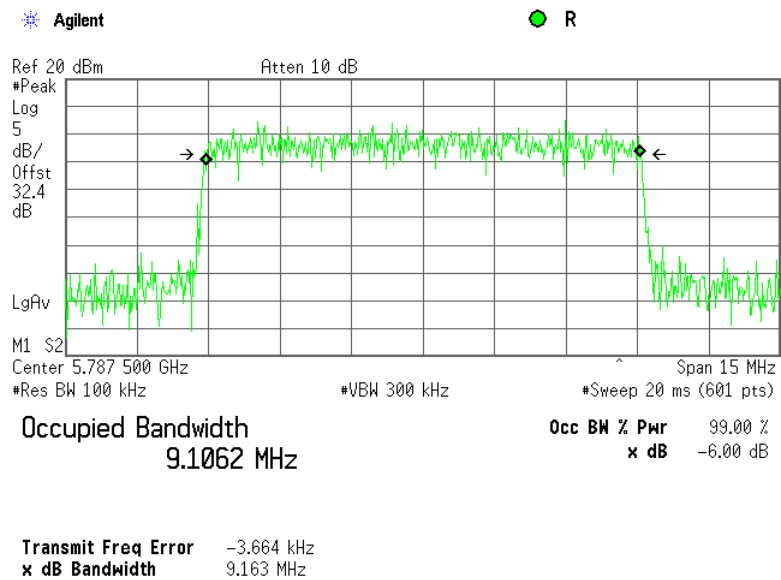
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<b>Test specification:</b> FCC section 15.247(a)(2), 6 dB bandwidth			
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 9/12/2012			
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.1.9 The 6 dB bandwidth test result at mid frequency, 10 MHz CBW, QPSK, Antenna 1



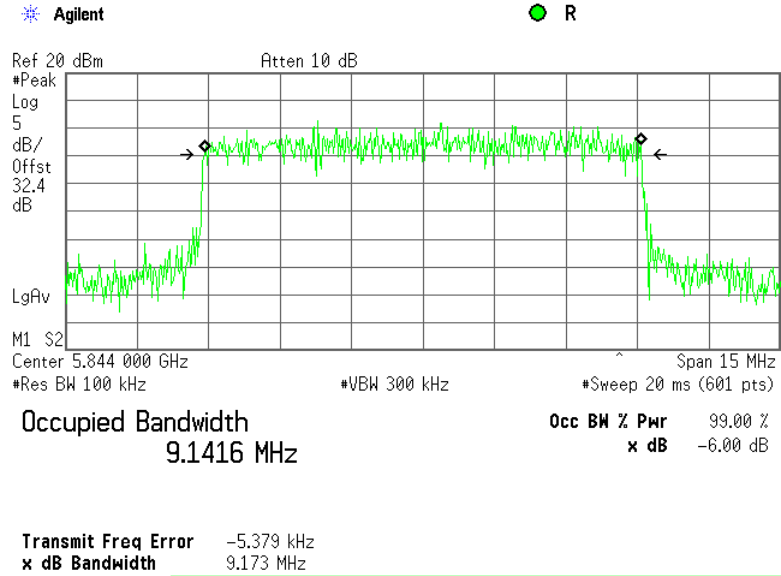
Plot 7.1.10 The 6 dB bandwidth test result at mid frequency, 10 MHz CBW, 64QAM, Antenna 1



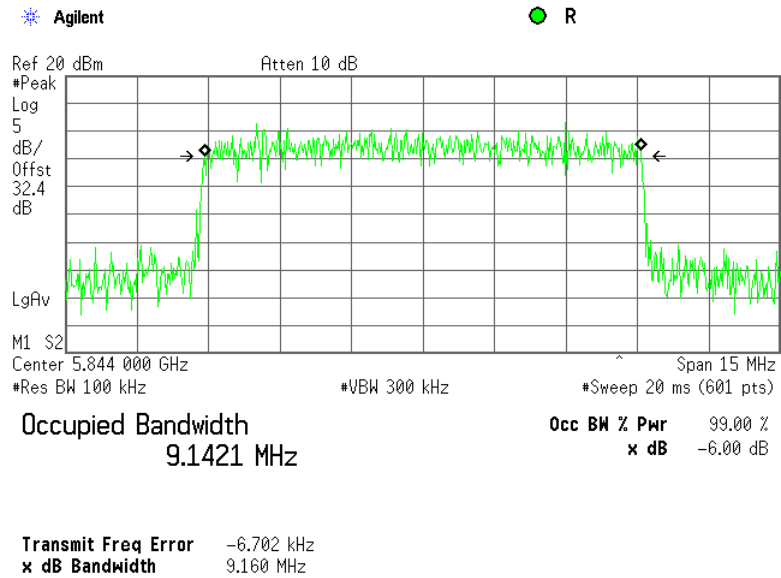


<b>Test specification:</b> FCC section 15.247(a)(2), 6 dB bandwidth	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 9/12/2012	
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa
	<b>Relative Humidity:</b> 48 %
	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>	

Plot 7.1.11 The 6 dB bandwidth test result at high frequency, 10 MHz CBW, QPSK, Antenna 1



Plot 7.1.12 The 6 dB bandwidth test result at high frequency, 10 MHz CBW, 64QAM, Antenna 1

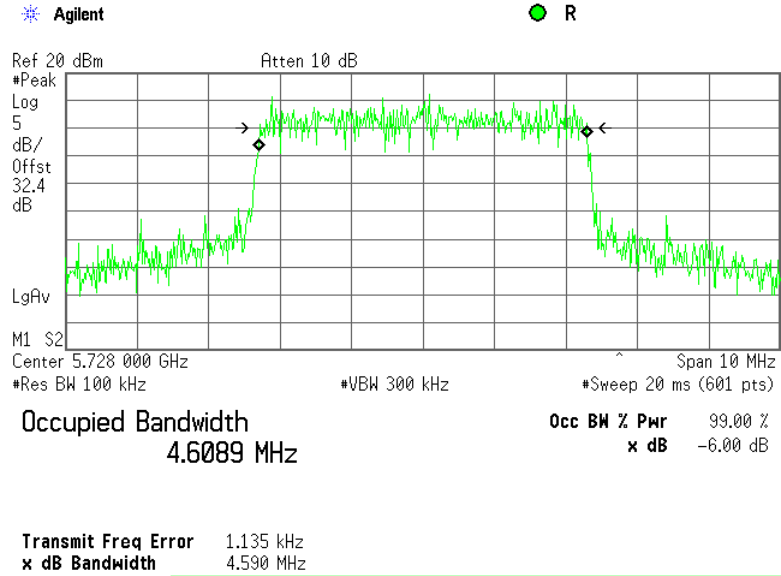




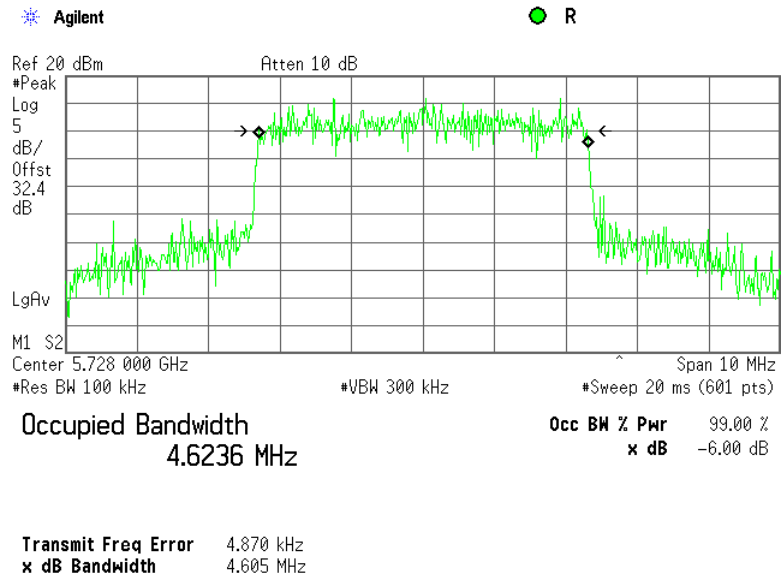


<b>Test specification:</b> FCC section 15.247(a)(2), 6 dB bandwidth			
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 9/12/2012			
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.1.13 The 6 dB bandwidth test result at low frequency, 5 MHz CBW, QPSK, Antenna 2



Plot 7.1.14 The 6 dB bandwidth test result at low frequency, 5 MHz CBW, 64QAM, Antenna 2

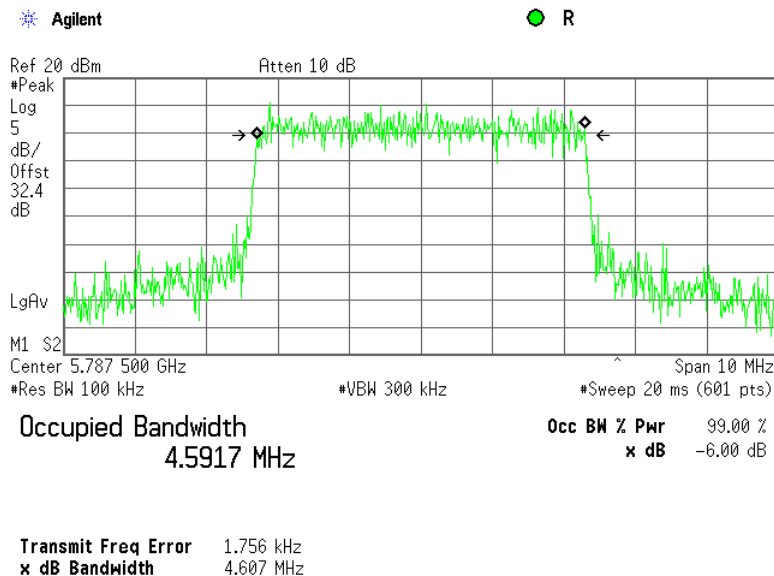




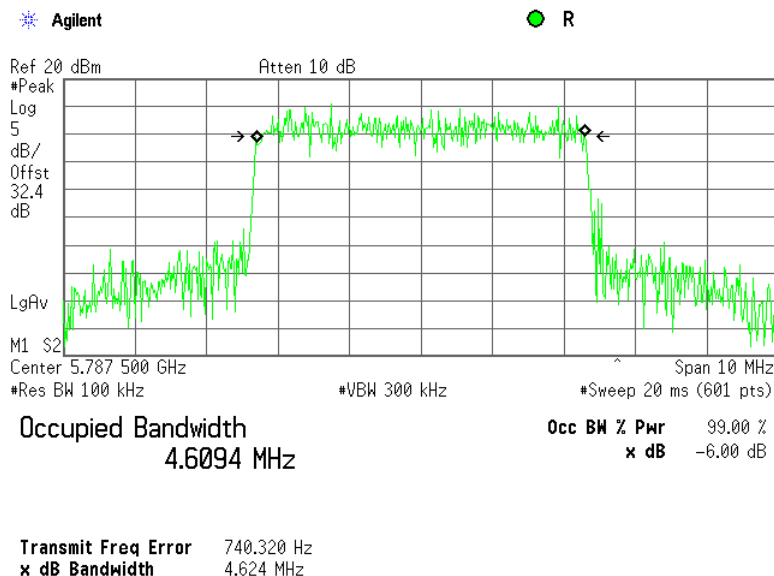
HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(a)(2), 6 dB bandwidth			
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01			
<b>Test mode:</b> Compliance			<b>Verdict:</b> PASS
<b>Date(s):</b> 9/12/2012			
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.1.15 The 6 dB bandwidth test result at mid frequency, 5 MHz CBW, QPSK, Antenna 2



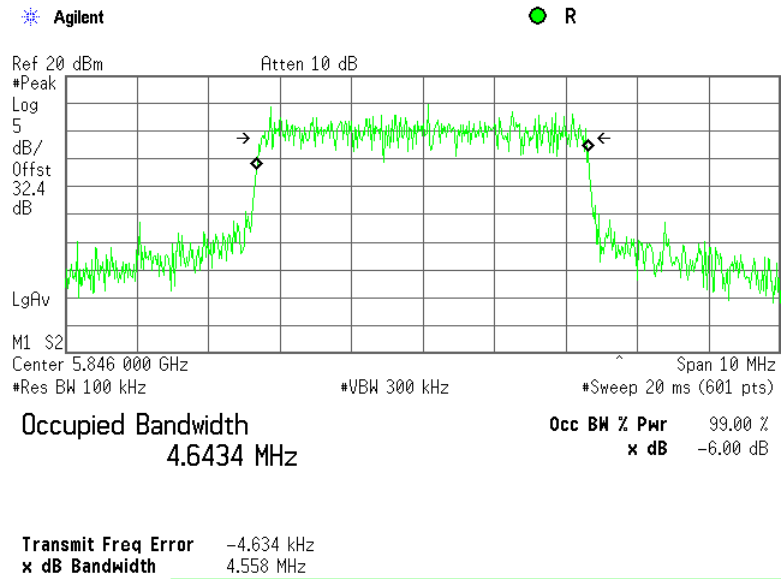
Plot 7.1.16 The 6 dB bandwidth test result at mid frequency, 5 MHz CBW, 64QAM, Antenna 2



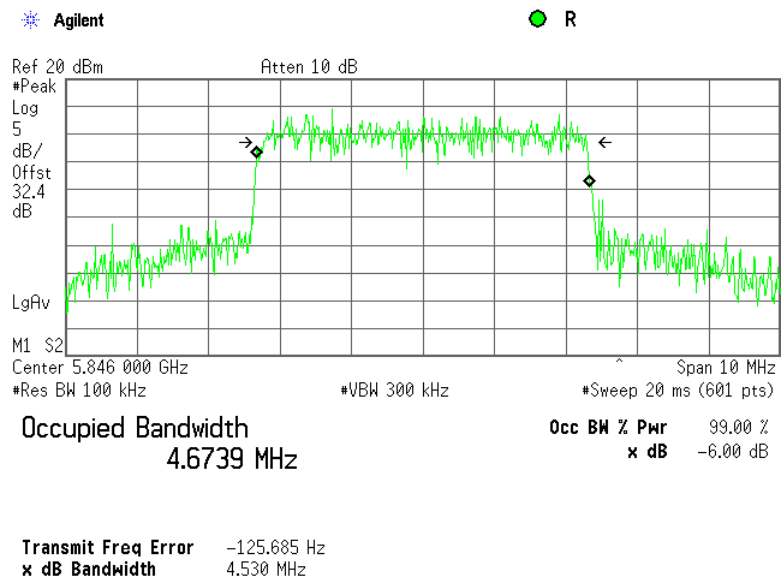


<b>Test specification:</b> FCC section 15.247(a)(2), 6 dB bandwidth			
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01			
<b>Test mode:</b> Compliance			<b>Verdict:</b> PASS
<b>Date(s):</b> 9/12/2012			
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.1.17 The 6 dB bandwidth test result at high frequency, 5 MHz CBW, QPSK, Antenna 2



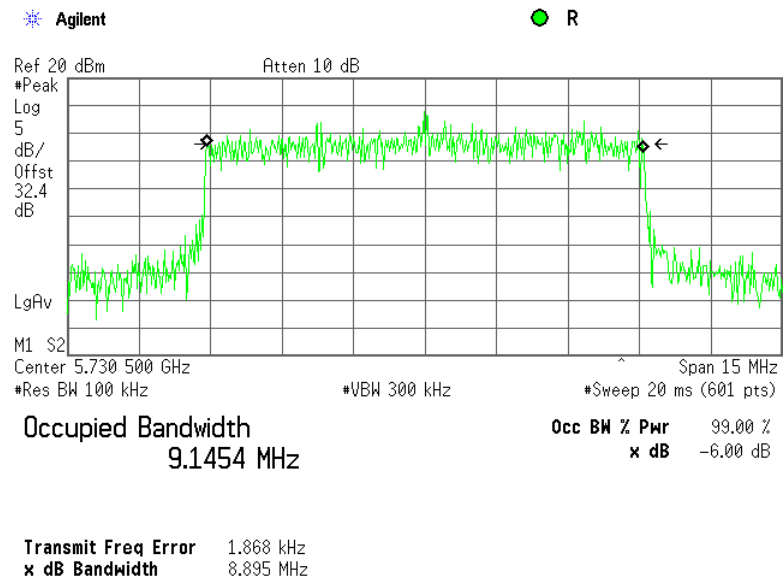
Plot 7.1.18 The 6 dB bandwidth test result at high frequency, 5 MHz CBW, 64QAM, Antenna 2



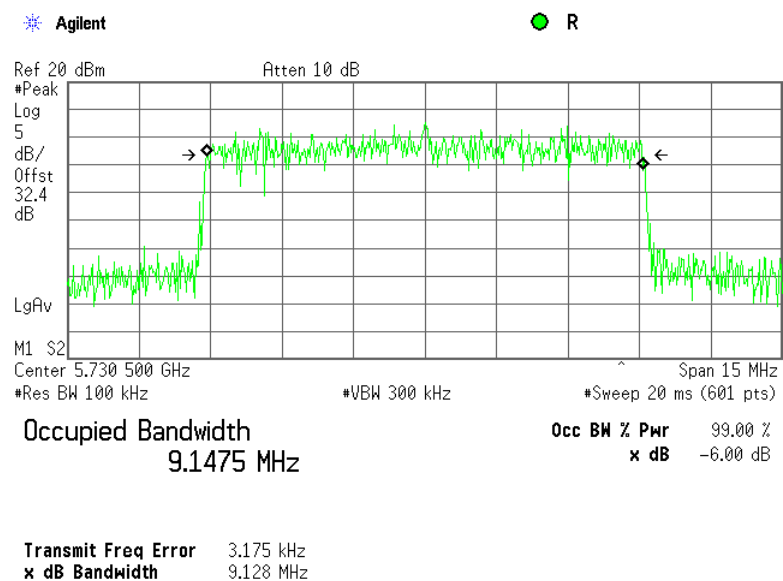


<b>Test specification:</b> FCC section 15.247(a)(2), 6 dB bandwidth	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 9/12/2012	
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa
	<b>Relative Humidity:</b> 48 %
	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>	

Plot 7.1.19 The 6 dB bandwidth test result at low frequency, 10 MHz CBW, QPSK, Antenna 2



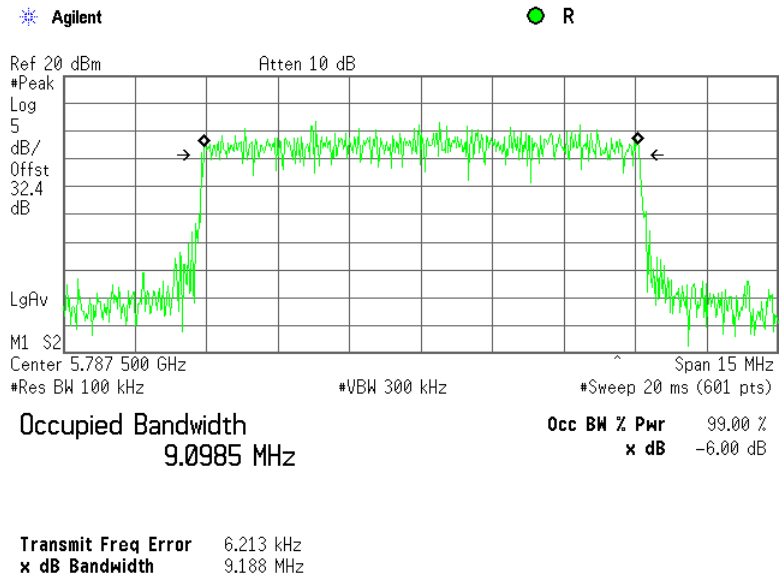
Plot 7.1.20 The 6 dB bandwidth test result at low frequency, 10 MHz CBW, 64QAM, Antenna 2



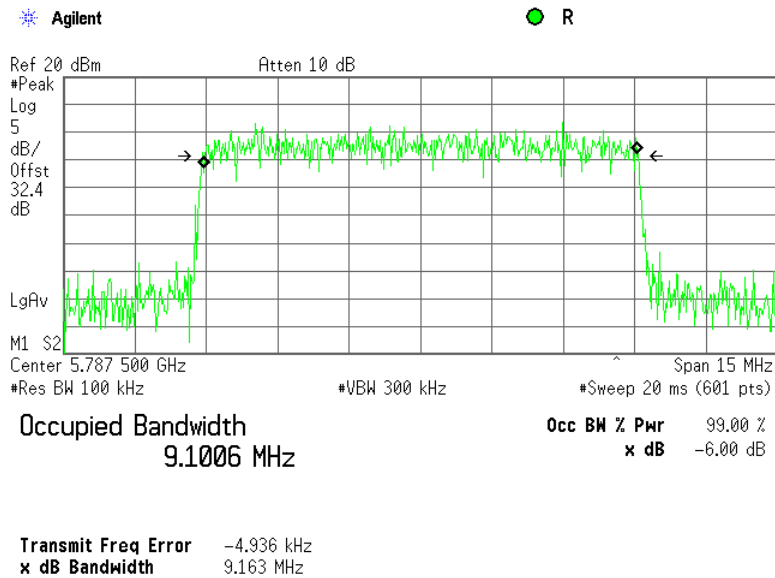


<b>Test specification:</b>		<b>FCC section 15.247(a)(2), 6 dB bandwidth</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/12/2012	
<b>Temperature:</b> 24 °C		<b>Air Pressure:</b> 1008 hPa	
		<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			
		<b>Verdict: PASS</b>	

Plot 7.1.21 The 6 dB bandwidth test result at mid frequency, 10 MHz CBW, QPSK, Antenna 2



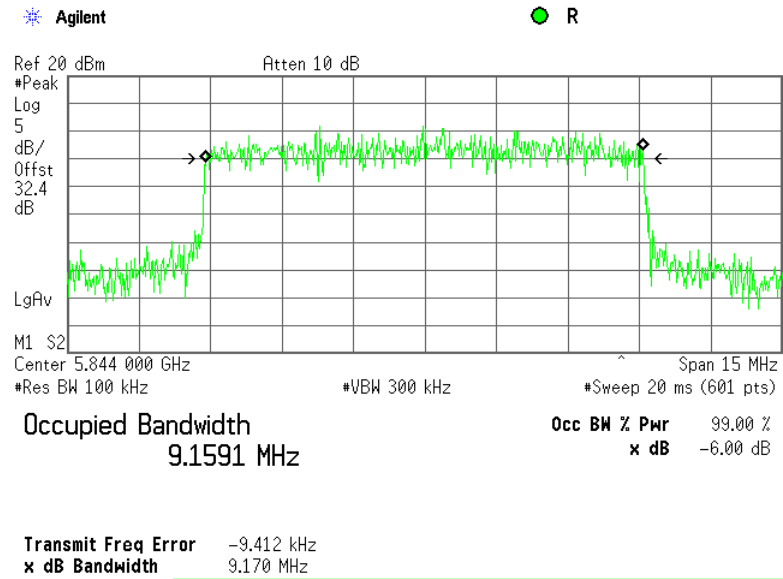
Plot 7.1.22 The 6 dB bandwidth test result at mid frequency, 10 MHz CBW, 64QAM, Antenna 2



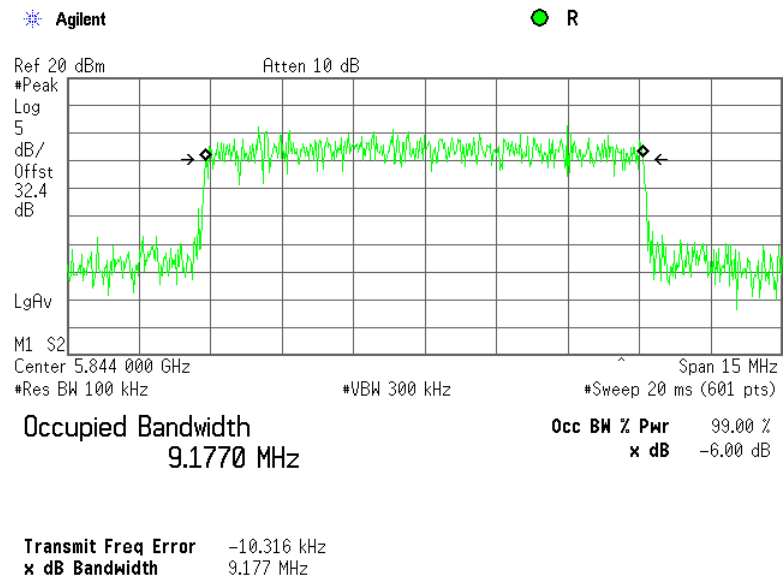


<b>Test specification:</b> FCC section 15.247(a)(2), 6 dB bandwidth			
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 9/12/2012			
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.1.23 The 6 dB bandwidth test result at high frequency, 10 MHz CBW, QPSK, Antenna 2



Plot 7.1.24 The 6 dB bandwidth test result at high frequency, 10 MHz CBW, 64QAM, Antenna 2





<b>Test specification:</b>		<b>FCC section 15.247(b)(3), Peak output power</b>	
<b>Test procedure:</b>		ANSI C63.10-2009 section 6.10.3.1	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/11/2012	
<b>Temperature:</b> 24 °C		<b>Air Pressure:</b> 1008 hPa	
<b>Remarks:</b>		<b>Verdict:</b> PASS	
		<b>Relative Humidity:</b> 48 %	
		<b>Power Supply:</b> 48 VDC	

## 7.2 Output power

### 7.2.1 General

This test was performed to measure the maximum average output power at the transmitter RF antenna connector. Specification test limits are given in Table 7.2.1.

**Table 7.2.1 Output power limits**

Assigned frequency range, MHz	Maximum antenna gain, dBi	Peak output power*	
		W	dBm
902.0 – 928.0	6.0	1.0	30.0
2400.0 – 2483.5			
5725.0 – 5850.0			

\*- If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power limit shall be reduced below the stated value as follows:

by 1 dB for every 3 dB that the directional gain of antenna exceeds 6 dBi for fixed point-to-point transmitters operate in 2400-2483.5 MHz band;

without any corresponding reduction for fixed point-to-point transmitters operate in 5725-5850 MHz band;  
by the amount in dB that the directional gain of antenna exceeds 6 dBi for the rest of transmitters.

### 7.2.2 Test procedure

7.2.2.1 The EUT was set up as shown in Figure 7.2.1, energized and its proper operation was checked.

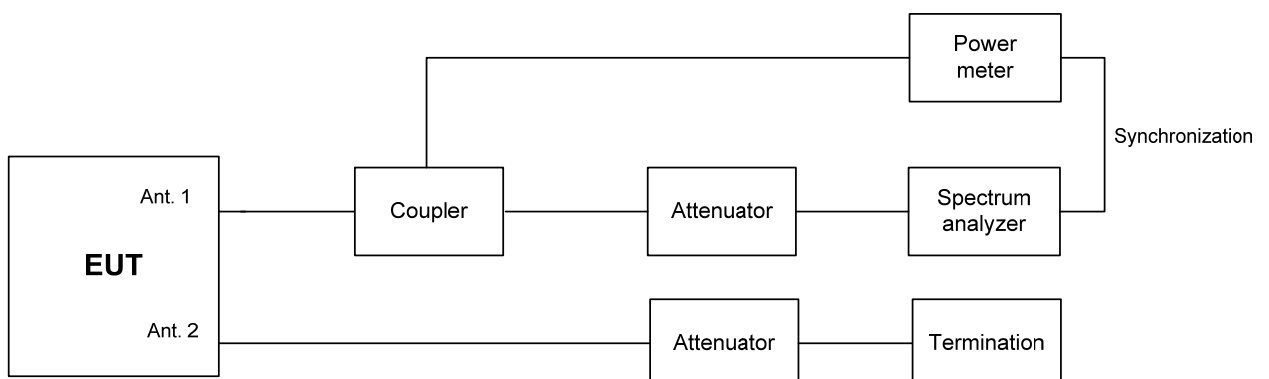
7.2.2.2 The EUT was adjusted to produce maximum available for end user RF output power.

7.2.2.3 The resolution bandwidth of spectrum analyzer was set to 1 MHz, VBW ≥3 MHz.

7.2.2.4 The peak power was measured using a sample detector and power averaging mode to find the highest level across the emission in any 1-MHz band after 100 sweeps of averaging.

7.2.2.5 The test results were recorded in Table 7.2.2 and shown in the associated plots.

**Figure 7.2.1 Output power test setup**





<b>Test specification:</b> FCC section 15.247(b)(3), Peak output power	
<b>Test procedure:</b> ANSI C63.10-2009 section 6.10.3.1	
<b>Test mode:</b> Compliance	<b>Verdict: PASS</b>
<b>Date(s):</b> 9/11/2012	
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa
<b>Relative Humidity:</b> 48 %	
<b>Power Supply:</b> 48 VDC	
<b>Remarks:</b>	

Table 7.2.2 Output power test results

ASSIGNED FREQUENCY RANGE: 5725-5850 MHz  
 DETECTOR USED: Average  
 MODULATING SIGNAL: PRBS  
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum  
 ANTENNA GAIN: 9.5 dBi

**EBW: 5 MHz**

Modulation	Carrier frequency, MHz	Power at antenna 1, dBm	Power at antenna 2, dBm	Total power*, dBm	Limit, ** dBm	Margin***, dB	Verdict
QPSK	5728.0	23.45	23.11	26.29	26.5	-0.21	Pass
	5782.5	23.51	22.95	26.25	26.5	-0.25	Pass
	5846.0	23.07	20.86	25.11	26.5	-1.39	Pass
64 QAM	5728.0	23.05	22.46	25.77	26.5	-0.73	Pass
	5782.5	23.09	22.94	26.02	26.5	-0.48	Pass
	5846.0	23.03	20.86	25.09	26.5	-1.41	Pass

**EBW: 10 MHz**

QPSK	5730.5	23.30	22.72	26.02	26.5	-0.48	Pass
	5787.5	23.19	23.01	26.11	26.5	-0.39	Pass
	5844.0	22.52	21.11	24.88	26.5	-1.62	Pass
64 QAM	5730.5	23.18	22.94	26.07	26.5	-0.43	Pass
	5787.5	23.40	23.16	26.29	26.5	-0.21	Pass
	5844.0	22.47	20.89	25.38	26.5	-1.12	Pass

\* - Total power, dBm = 10 log {(10<sup>^</sup> [(P (dBm, Ant1)/10] + 10<sup>^</sup> [(P (dBm, Ant2))/10])}

\*\* Limit, dBm = 30 - (Antenna gain-6) =26.5 dBm

\*\*\*- Margin, dB = Total power, dBm – specified limit, dBm.

**Reference numbers of test equipment used**

HL 3301	HL 3302	HL 3786	HL 3818	HL 3903	HL 4366		
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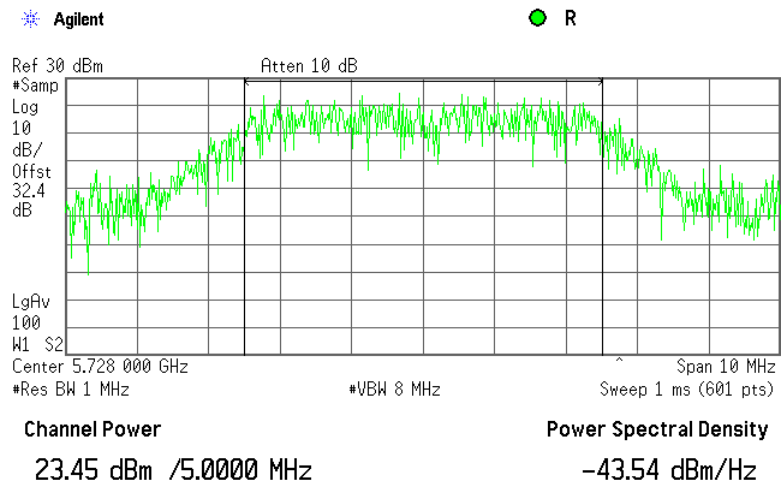
Full description is given in Appendix A.



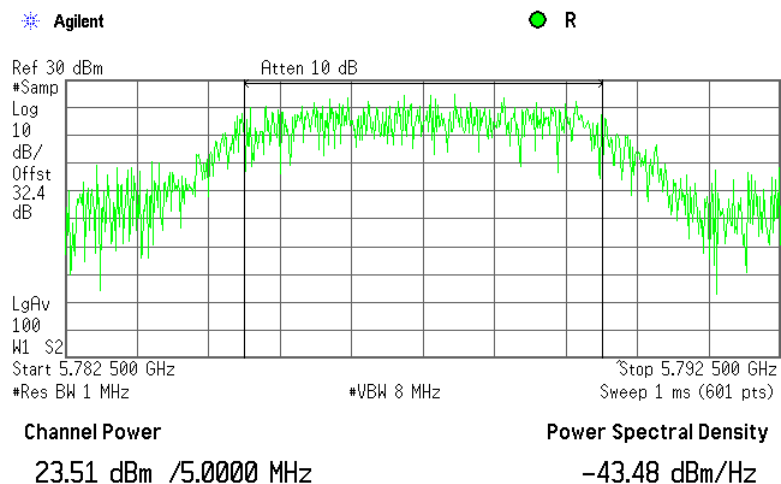


<b>Test specification:</b> FCC section 15.247(b)(3), Peak output power			
<b>Test procedure:</b> ANSI C63.10-2009 section 6.10.3.1			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 9/11/2012			
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.2.1 Output power at antenna 1 at low frequency, 5 MHz BW, QPSK modulation



Plot 7.2.2 Output power at antenna 1 at mid frequency, 5 MHz BW, QPSK modulation

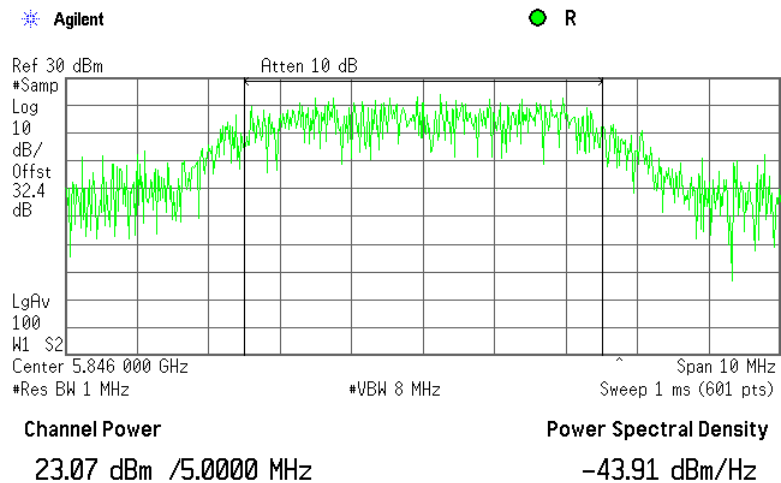




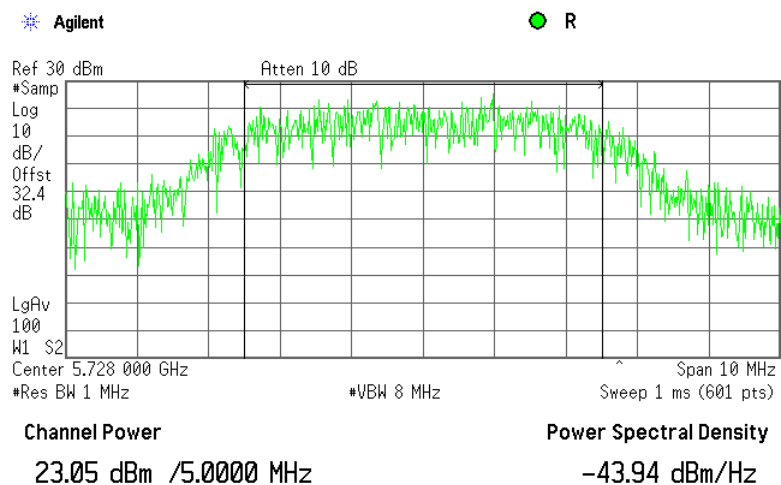
HERMON LABORATORIES

<b>Test specification:</b>		<b>FCC section 15.247(b)(3), Peak output power</b>	
<b>Test procedure:</b>		ANSI C63.10-2009 section 6.10.3.1	
<b>Test mode:</b>		<b>Verdict:</b>	
Compliance		PASS	
<b>Date(s):</b>		9/11/2012	
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.2.3 Output power at antenna 1 at high frequency, 5 MHz BW, QPSK modulation



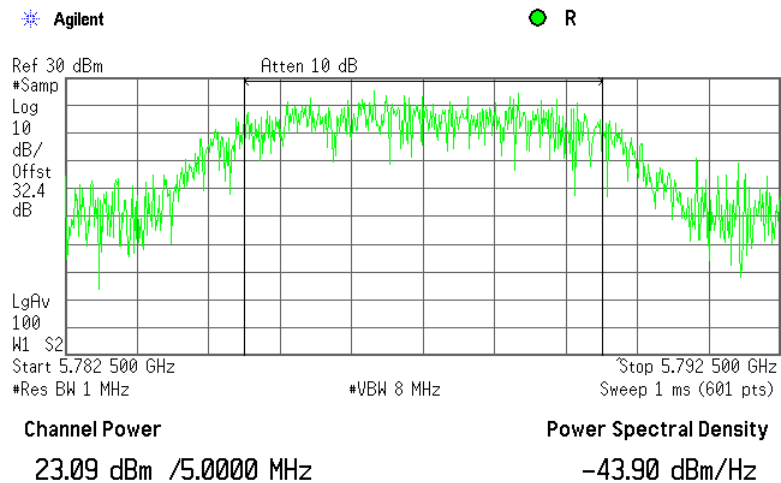
Plot 7.2.4 Output power at antenna 1 at low frequency, 5 MHz BW, 64QAM modulation



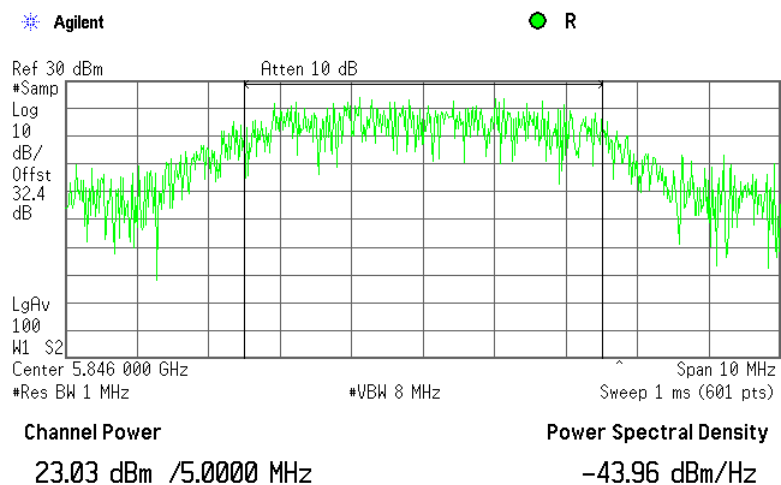


<b>Test specification:</b> FCC section 15.247(b)(3), Peak output power			
<b>Test procedure:</b> ANSI C63.10-2009 section 6.10.3.1			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 9/11/2012			
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.2.5 Output power at antenna 1 at mid frequency, 5 MHz BW, 64QAM modulation



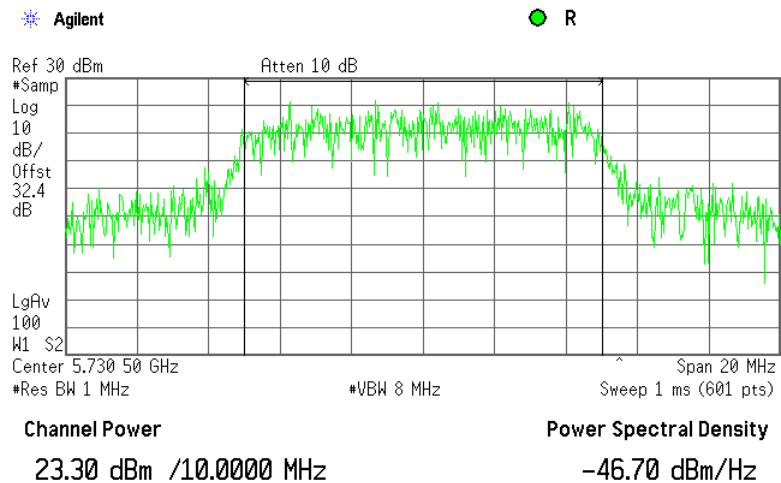
Plot 7.2.6 Output power at antenna 1 at high frequency, 5 MHz BW, 64QAM modulation



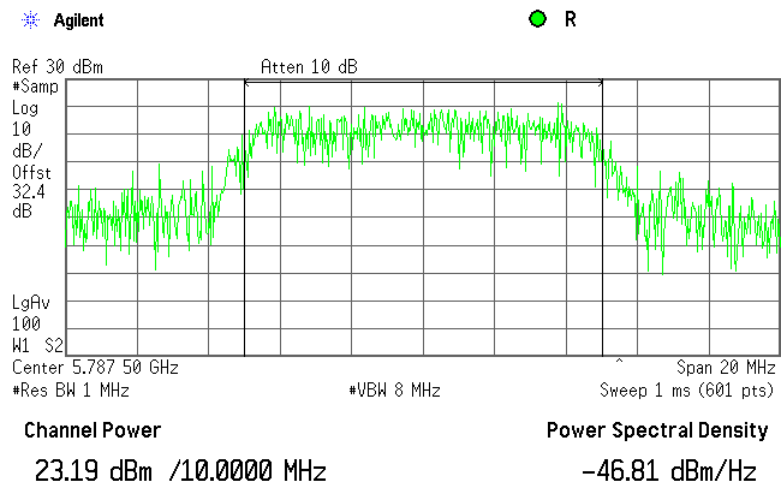


<b>Test specification:</b>		<b>FCC section 15.247(b)(3), Peak output power</b>	
<b>Test procedure:</b>		ANSI C63.10-2009 section 6.10.3.1	
<b>Test mode:</b>		<b>Verdict:</b>	
Compliance		PASS	
<b>Date(s):</b>		9/11/2012	
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.2.7 Output power at antenna 1 at low frequency, 10 MHz BW, QPSK modulation



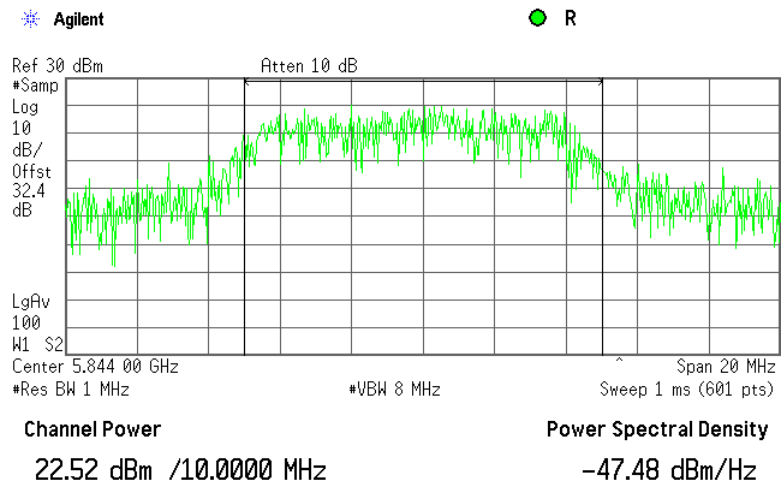
Plot 7.2.8 Output power at antenna 1 at mid frequency, 10 MHz BW, QPSK modulation



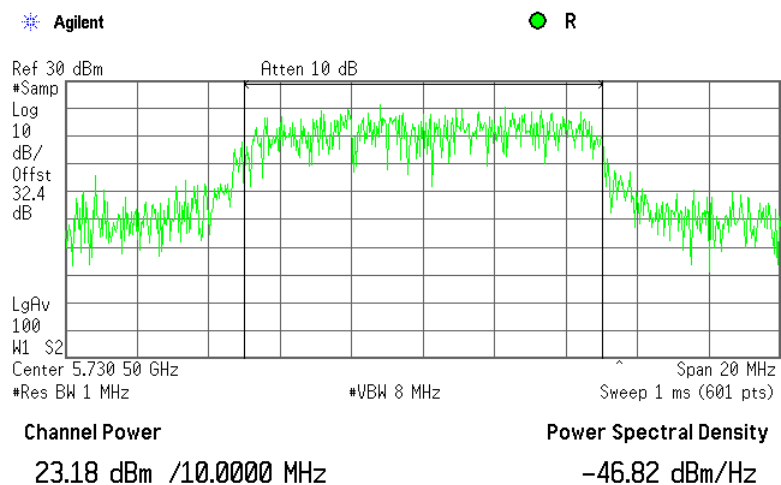


<b>Test specification:</b>		<b>FCC section 15.247(b)(3), Peak output power</b>	
<b>Test procedure:</b>		ANSI C63.10-2009 section 6.10.3.1	
<b>Test mode:</b>		<b>Verdict:</b> PASS	
<b>Date(s):</b> 9/11/2012			
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.2.9 Output power at antenna 1 at high frequency, 10 MHz BW, QPSK modulation



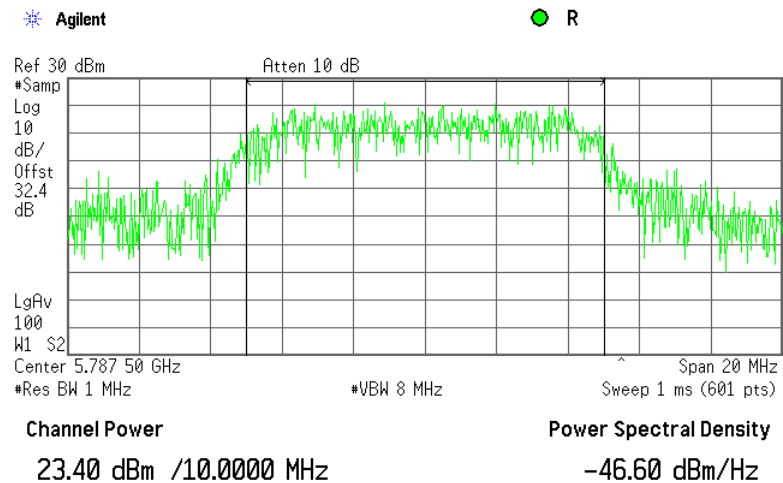
Plot 7.2.10 Output power at antenna 1 at low frequency, 10 MHz BW, 64QAM modulation



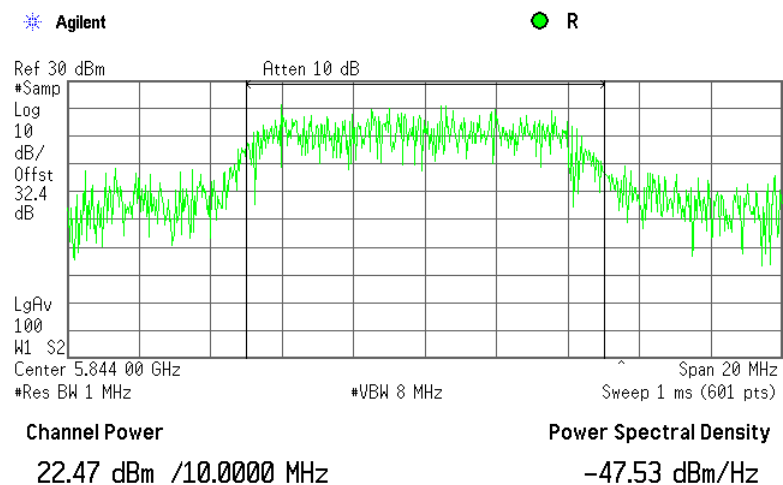


<b>Test specification:</b> FCC section 15.247(b)(3), Peak output power			
<b>Test procedure:</b> ANSI C63.10-2009 section 6.10.3.1			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 9/11/2012			
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.2.11 Output power at antenna 1 at mid frequency, 10 MHz BW, 64QAM modulation



Plot 7.2.12 Output power at antenna 1 at high frequency, 10 MHz BW, 64QAM modulation

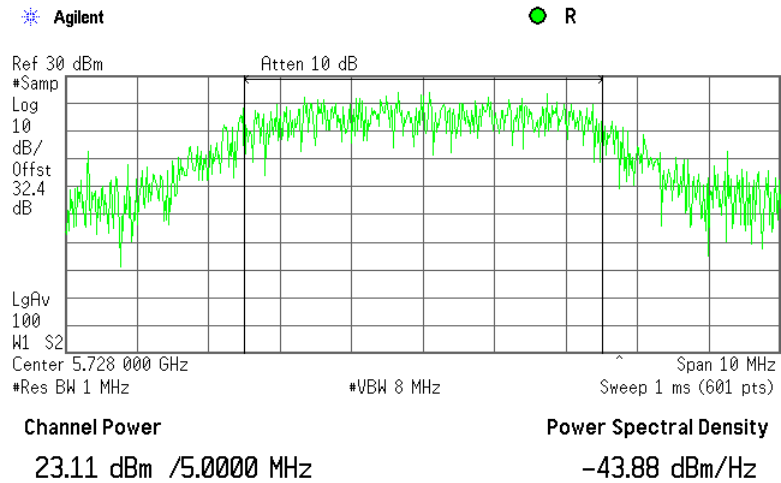




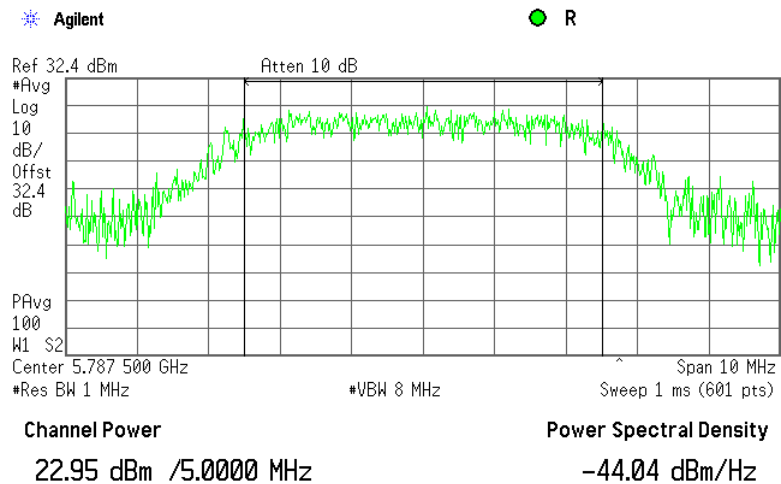
HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(b)(3), Peak output power			
<b>Test procedure:</b> ANSI C63.10-2009 section 6.10.3.1			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 9/11/2012			
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.2.13 Output power at antenna 2 at low frequency, 5 MHz BW, QPSK modulation



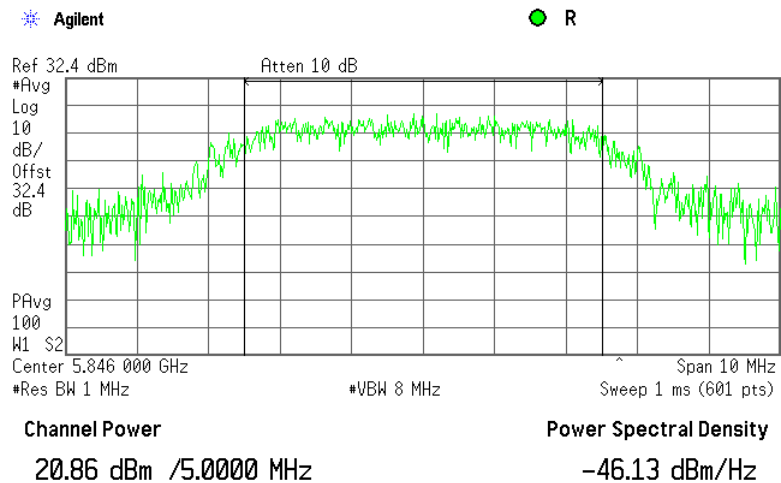
Plot 7.2.14 Output power at antenna 2 at mid frequency, 5 MHz BW, QPSK modulation



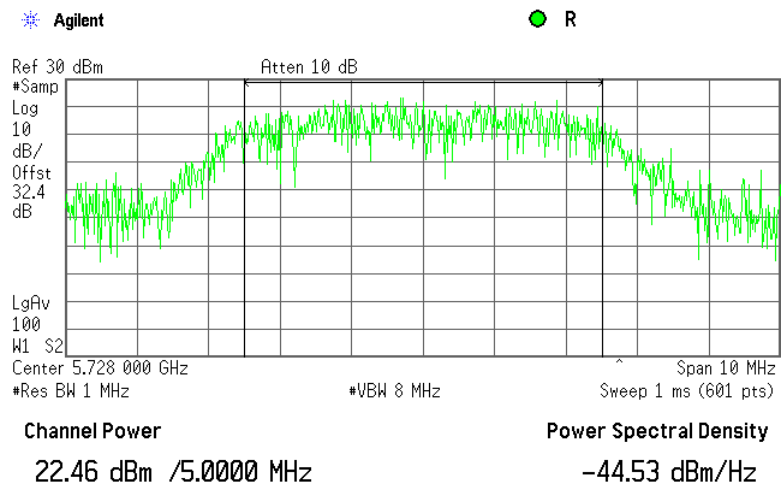


<b>Test specification:</b> FCC section 15.247(b)(3), Peak output power			
<b>Test procedure:</b> ANSI C63.10-2009 section 6.10.3.1			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 9/11/2012			
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.2.15 Output power at antenna 2 at high frequency, 5 MHz BW, QPSK modulation



Plot 7.2.16 Output power at antenna 2 at low frequency, 5 MHz BW, 64QAM modulation



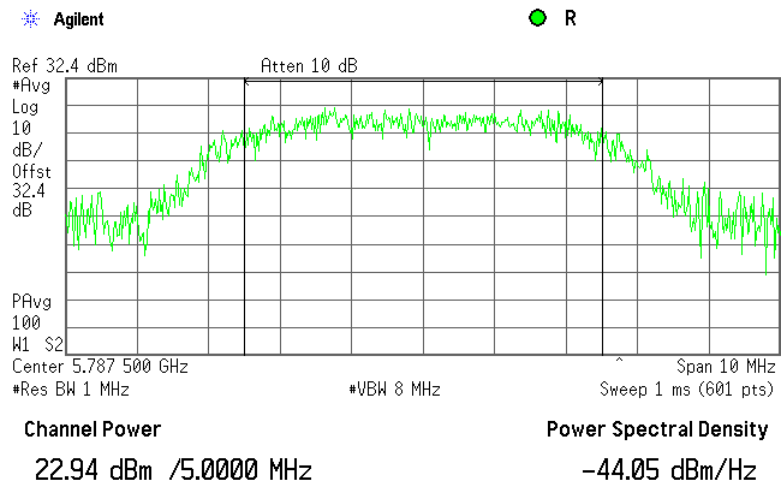




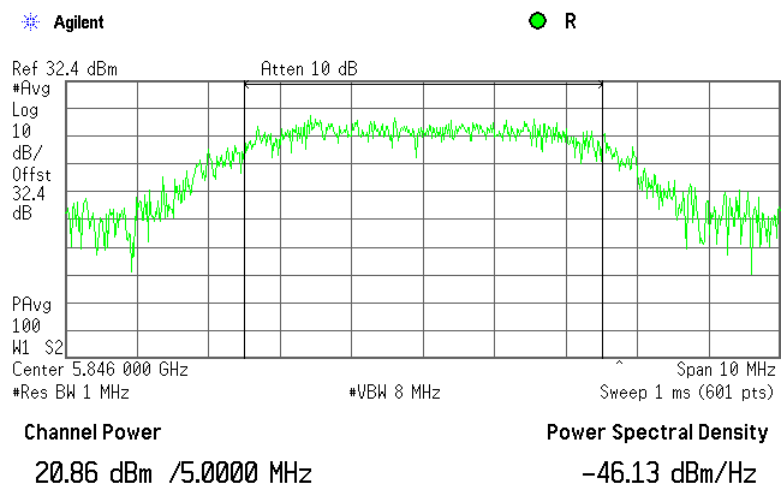
HERMON LABORATORIES

<b>Test specification:</b>		<b>FCC section 15.247(b)(3), Peak output power</b>	
<b>Test procedure:</b>		ANSI C63.10-2009 section 6.10.3.1	
<b>Test mode:</b>		<b>Verdict:</b>	
Compliance		PASS	
<b>Date(s):</b>		9/11/2012	
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.2.17 Output power at antenna 2 at mid frequency, 5 MHz BW, 64QAM modulation



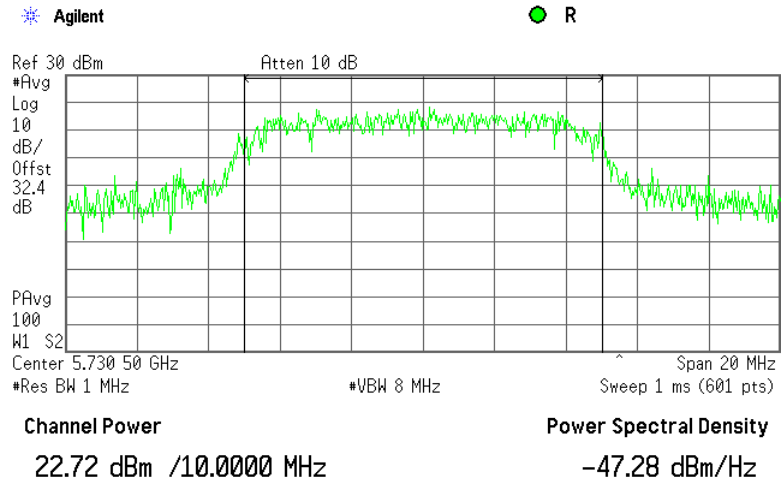
Plot 7.2.18 Output power at antenna 2 at high frequency, 5 MHz BW, 64QAM modulation



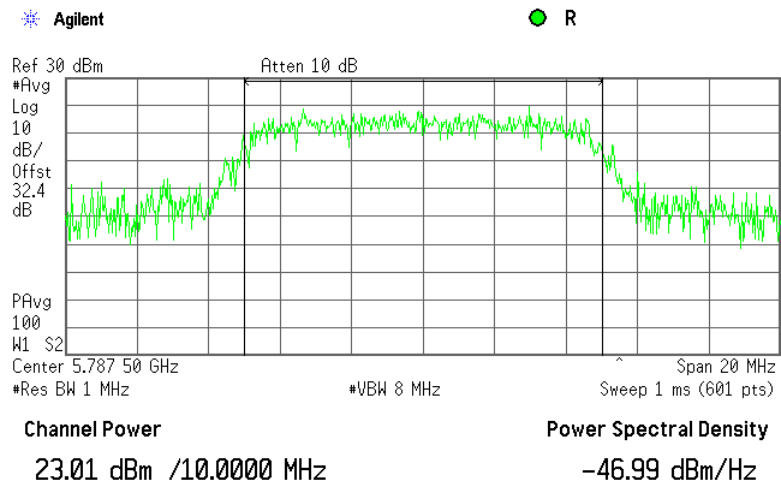


<b>Test specification:</b> FCC section 15.247(b)(3), Peak output power			
<b>Test procedure:</b> ANSI C63.10-2009 section 6.10.3.1			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 9/11/2012			
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.2.19 Output power at antenna 2 at low frequency, 10 MHz BW, QPSK modulation



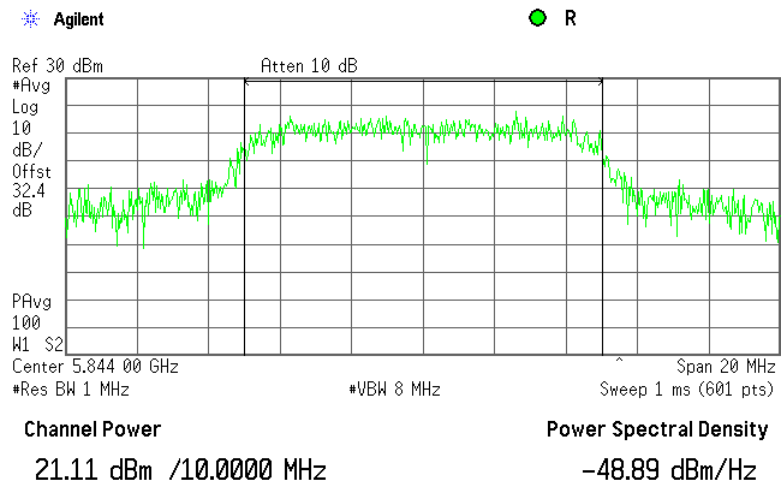
Plot 7.2.20 Output power at antenna 2 at mid frequency, 10 MHz BW, QPSK modulation



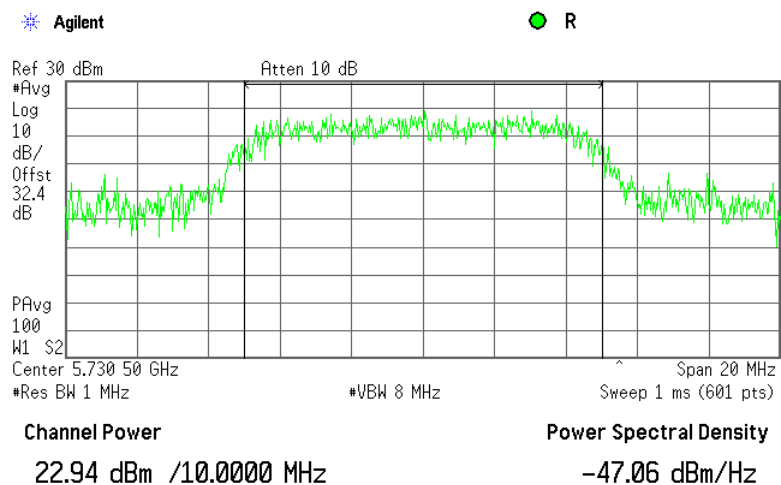


<b>Test specification:</b> FCC section 15.247(b)(3), Peak output power			
<b>Test procedure:</b> ANSI C63.10-2009 section 6.10.3.1			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 9/11/2012			
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.2.21 Output power at antenna 2 at high frequency, 10 MHz BW, QPSK modulation



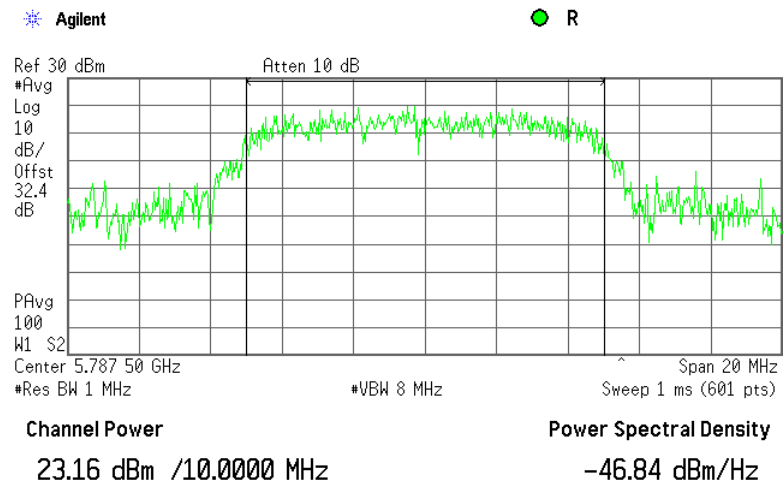
Plot 7.2.22 Output power at antenna 2 at low frequency, 10 MHz BW, 64QAM modulation



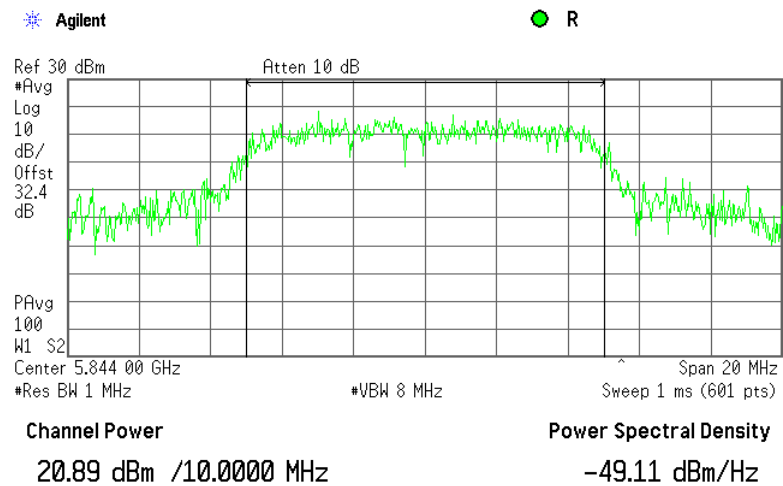


<b>Test specification:</b>		<b>FCC section 15.247(b)(3), Peak output power</b>	
<b>Test procedure:</b>		ANSI C63.10-2009 section 6.10.3.1	
<b>Test mode:</b>		<b>Verdict:</b>	
Compliance		PASS	
<b>Date(s):</b>		9/11/2012	
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.2.23 Output power at antenna 2 at mid frequency, 10 MHz BW, 64QAM modulation



Plot 7.2.24 Output power at antenna 2 at high frequency, 10 MHz BW, 64QAM modulation





<b>Test specification:</b>		<b>FCC section 15.247(d), Conducted spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01, section 5.4	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/11/2012	
<b>Temperature:</b> 24 °C		<b>Air Pressure:</b> 1008 hPa	
		<b>Relative Humidity:</b> 48 %	
		<b>Power Supply:</b> 48 VDC	
<b>Remarks:</b>			

### 7.3 Spurious emissions at RF antenna connector

#### 7.3.1 General

This test was performed to measure spurious emissions at RF antenna connector. Specification test limits are given in Table 7.3.1.

Table 7.3.1 Spurious emission limits

Frequency*, MHz	Attenuation below carrier**, dBc
0.009 – 10 <sup>th</sup> harmonic	20.0 (30.0)

\* - The above limits applied from the lowest radio frequency generated in the device, without going below 9 kHz up to the tenth harmonic of the highest fundamental frequency.

\*\* - Spurious emission limit is provided in terms of attenuation below the peak of modulated carrier measured with the same resolution bandwidth (100 kHz).

#### 7.3.2 Test procedure

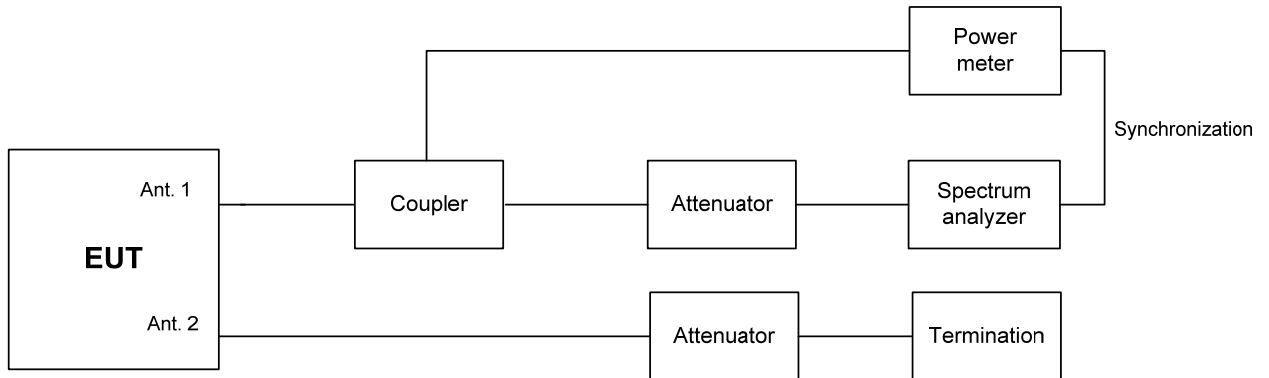
7.3.2.1 The EUT was set up as shown in Figure 7.3.1, energized and its proper operation was checked.

7.3.2.2 The EUT was adjusted to produce maximum available to end user RF output power.

7.3.2.3 The highest emission level within the authorized band was measured.

7.3.2.4 The spurious emission was measured with spectrum analyzer and referenced to the highest emission level measured within the authorized band. The test results provided in Table 7.3.2 and the associated plots

Figure 7.3.1 Spurious emission test setup





<b>Test specification:</b>		<b>FCC section 15.247(d), Conducted spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01, section 5.4	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/11/2012	
<b>Temperature:</b> 24 °C		<b>Air Pressure:</b> 1008 hPa	
		<b>Relative Humidity:</b> 48 %	
		<b>Power Supply:</b> 48 VDC	
<b>Remarks:</b>			

**Table 7.3.2 Spurious emission test results**

ASSIGNED FREQUENCY RANGE: 5725-5850 MHz  
 INVESTIGATED FREQUENCY RANGE: 0.009 -40000 MHz  
 DETECTOR USED: Average  
 RESOLUTION BANDWIDTH: 100 kHz  
 VIDEO BANDWIDTH: 300 kHz  
 MODULATION: 64QAM  
 MODULATING SIGNAL: PRBS  
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum  
 EBW 5 MHz

Frequency, MHz	Spurious emission, dBm	Emission at carrier, dBm	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
<b>Low carrier frequency</b>						
5724.6	-23.401	14.990	38.391	30.0	8.391	Pass
11458	-42.130	14.990	57.120	30.0	27.120	Pass
17190	-44.420	14.990	59.410	30.0	29.410	Pass
<b>Mid carrier frequency</b>						
11575	-43.280	16.083	59.363	30.0	29.363	Pass
17364	-43.910	16.083	59.993	30.0	29.993	Pass
<b>High carrier frequency</b>						
5851.03	-26.260	15.598	41.858	30.0	11.858	Pass
11692	-38.150	15.598	53.748	30.0	23.748	Pass
17538	-37.680	15.598	53.278	30.0	23.278	Pass

\*- Margin, dB = Attenuation below carrier, dBc – specification limit, dBc.

**Reference numbers of test equipment used**

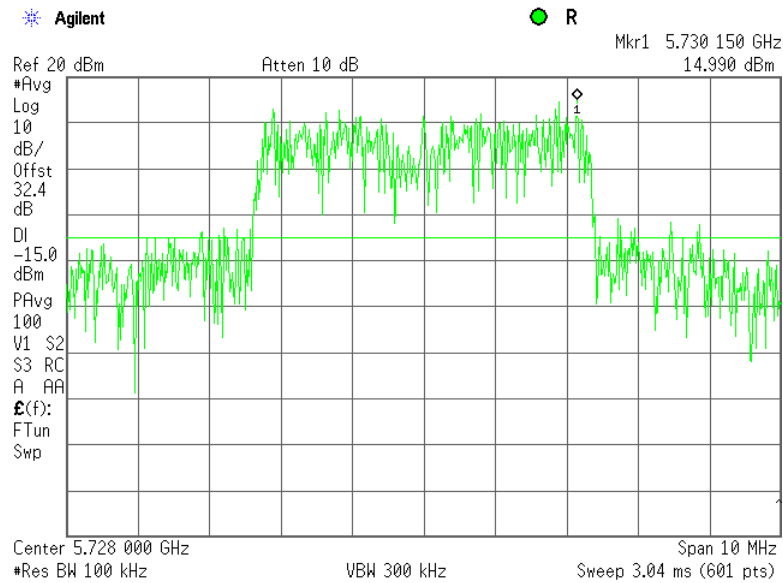
HL 3301	HL 3302	HL 3442	HL 3786	HL 3818	HL 3868	HL 3903	HL 4342
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Full description is given in Appendix A.



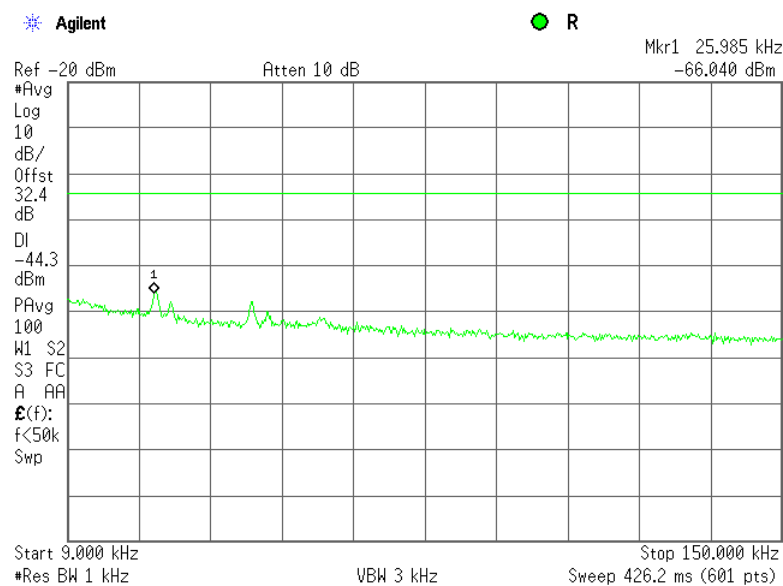
<b>Test specification:</b>		<b>FCC section 15.247(d), Conducted spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01, section 5.4	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/11/2012	
<b>Temperature:</b> 24 °C		<b>Air Pressure:</b> 1008 hPa	
		<b>Relative Humidity:</b> 48 %	
		<b>Power Supply:</b> 48 VDC	
<b>Remarks:</b>			

Plot 7.3.1 The highest emission level within the assigned band at low carrier frequency



DL= -15.0 dBm (14.99 dBm – 30 dB) according to 30 dBc spurious limit outside restricted band

Plot 7.3.2 Spurious emission measurements in 9 - 150 kHz range at low carrier frequency



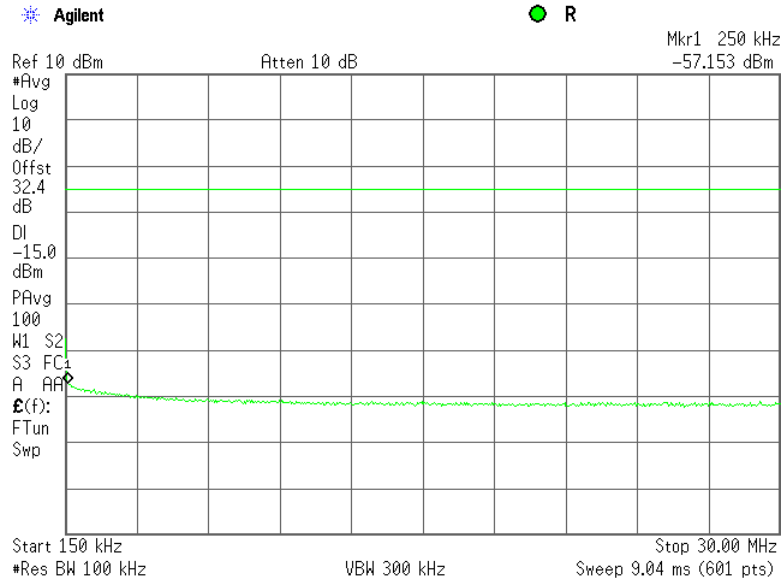
Note: the -15.0 dBm limit shall be applied



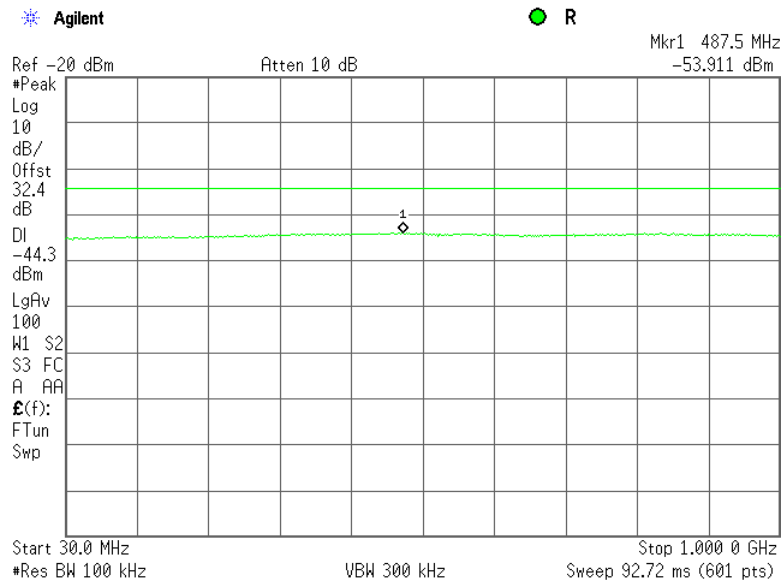
HERMON LABORATORIES

<b>Test specification:</b>		<b>FCC section 15.247(d), Conducted spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01, section 5.4	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/11/2012	
<b>Temperature:</b> 24 °C		<b>Air Pressure:</b> 1008 hPa	
		<b>Relative Humidity:</b> 48 %	
		<b>Power Supply:</b> 48 VDC	
<b>Remarks:</b>			
		<b>Verdict:</b> PASS	

Plot 7.3.3 Spurious emission measurements in 0.15 - 30 MHz range at low carrier frequency



Plot 7.3.4 Spurious emission measurements in 30 - 1000 MHz range at low carrier frequency



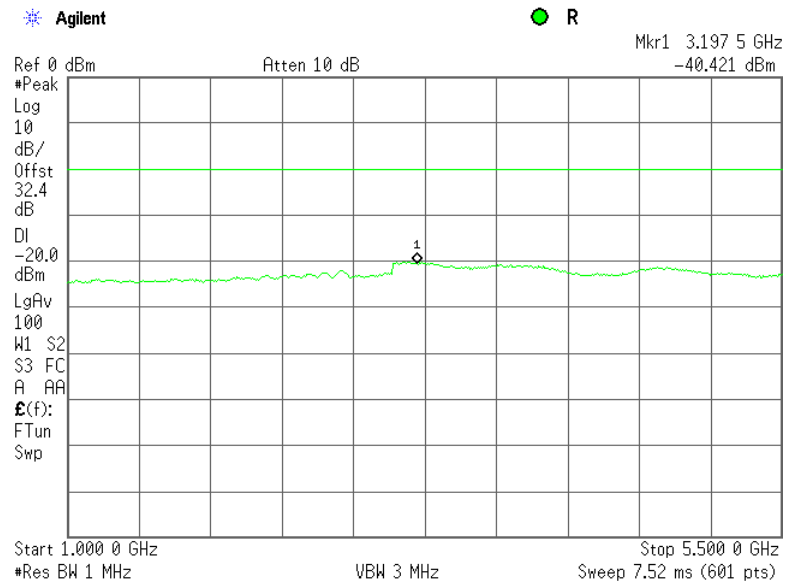
Note: the -15.0 dBm limit shall be applied





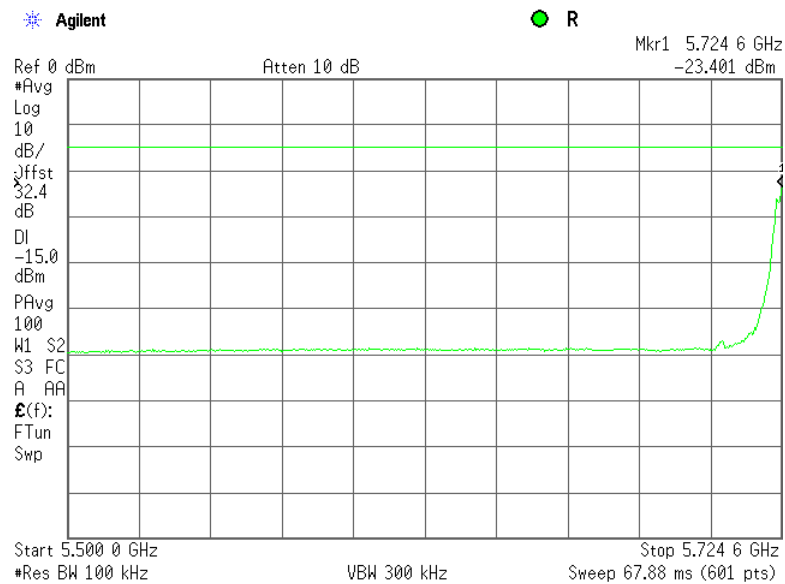
<b>Test specification:</b>		<b>FCC section 15.247(d), Conducted spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01, section 5.4	
<b>Test mode:</b>		<b>Verdict:</b>	
Compliance		PASS	
<b>Date(s):</b>		9/11/2012	
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.3.5 Spurious emission measurements in 1000 – 5500 MHz range at low carrier frequency



Note: the -15.0 dBm limit shall be applied

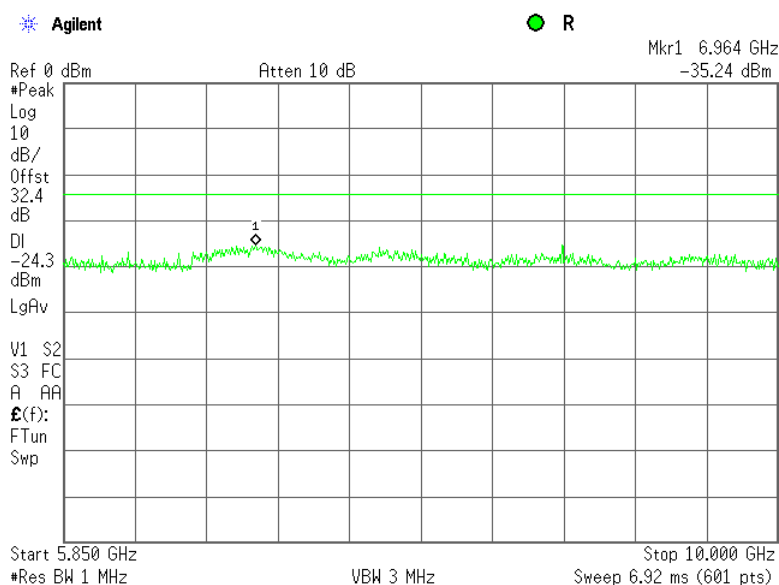
Plot 7.3.6 Spurious emission measurements in 5500 – 5724.55 MHz range at low carrier frequency





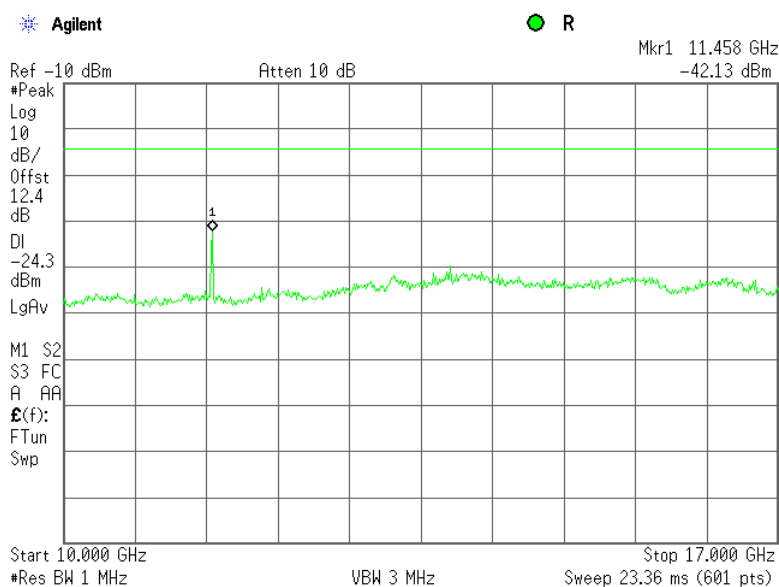
<b>Test specification:</b>		<b>FCC section 15.247(d), Conducted spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01, section 5.4	
<b>Test mode:</b>		<b>Verdict:</b>	
Compliance		PASS	
<b>Date(s):</b>		9/11/2012	
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.3.7 Spurious emission measurements in 5850 – 10000 MHz range at low carrier frequency



Note: the -15.0 dBm limit shall be applied

Plot 7.3.8 Spurious emission measurements in 10000 – 17000 MHz range at low carrier frequency

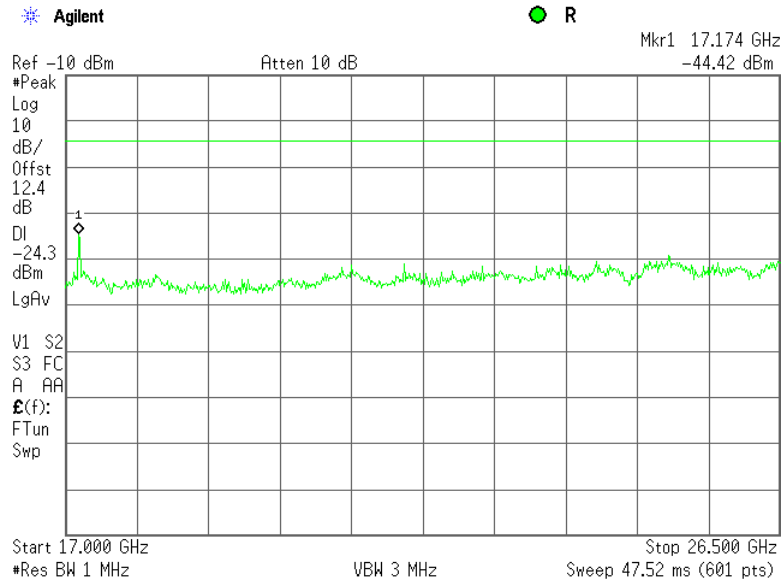


Note: the -15.0 dBm limit shall be applied



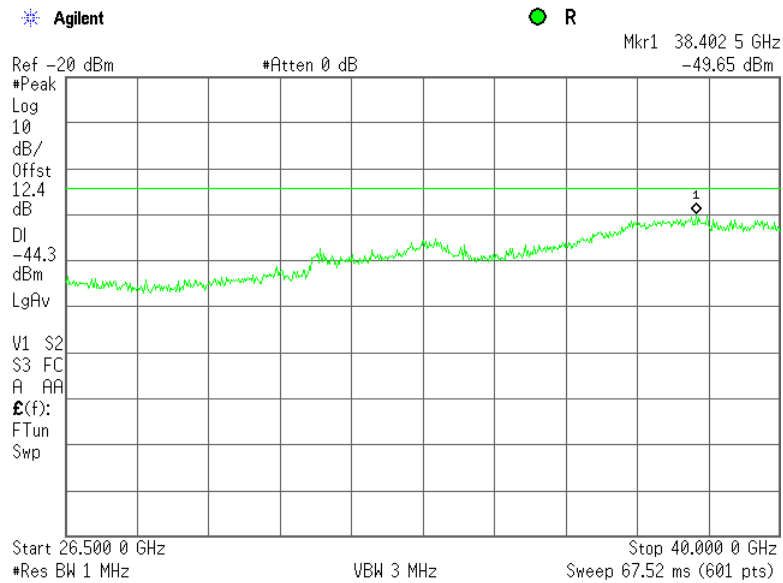
<b>Test specification:</b>		<b>FCC section 15.247(d), Conducted spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01, section 5.4	
<b>Test mode:</b>		<b>Verdict:</b>	
Compliance		PASS	
<b>Date(s):</b>		9/11/2012	
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.3.9 Spurious emission measurements in 17000 – 26500 MHz range at low carrier frequency



Note: the -15.0 dBm limit shall be applied

Plot 7.3.10 Spurious emission measurements in 26500-40000 MHz range at low carrier frequency



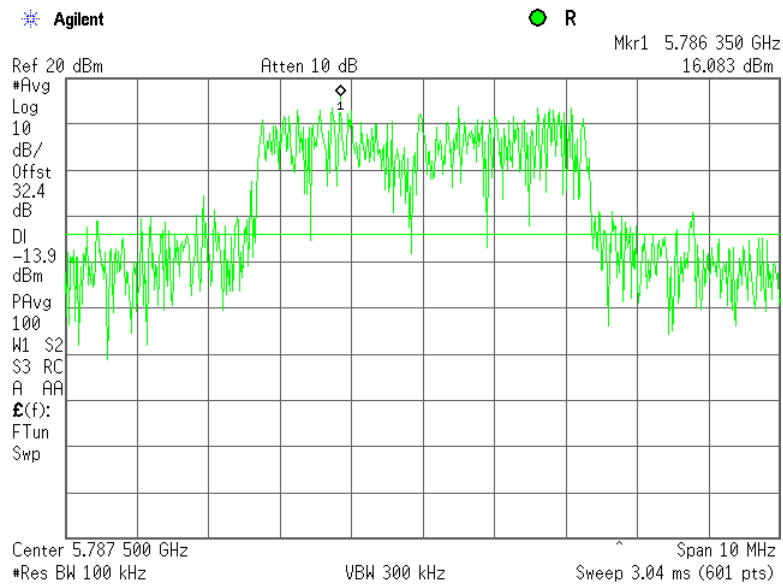
Note: the -15.0 dBm limit shall be applied



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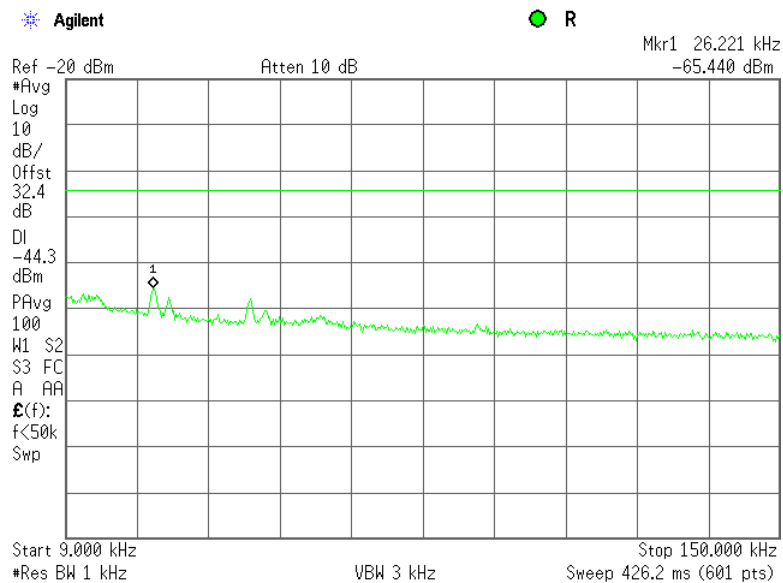
<b>Test specification:</b>		<b>FCC section 15.247(d), Conducted spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01, section 5.4	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/11/2012	
<b>Temperature:</b> 24 °C		<b>Air Pressure:</b> 1008 hPa	
		<b>Relative Humidity:</b> 48 %	
		<b>Power Supply:</b> 48 VDC	
<b>Remarks:</b>			
		<b>Verdict:</b> PASS	

Plot 7.3.11 The highest emission level within the assigned band at mid carrier frequency



DL= -13.9 dBm (16.1 dBm – 30 dB) according to 30 dBc spurious limit outside restricted band

Plot 7.3.12 Spurious emission measurements in 9 - 150 kHz range at mid carrier frequency

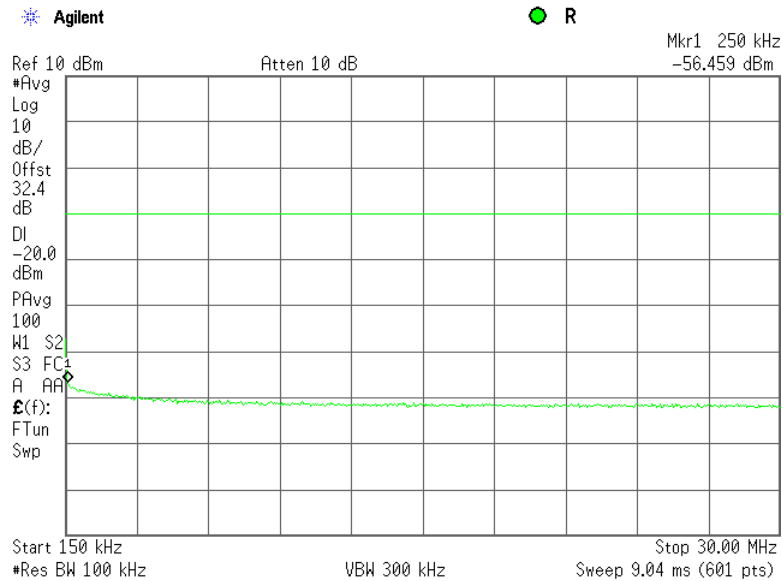


Note: the -13.9 dBm limit shall be applied



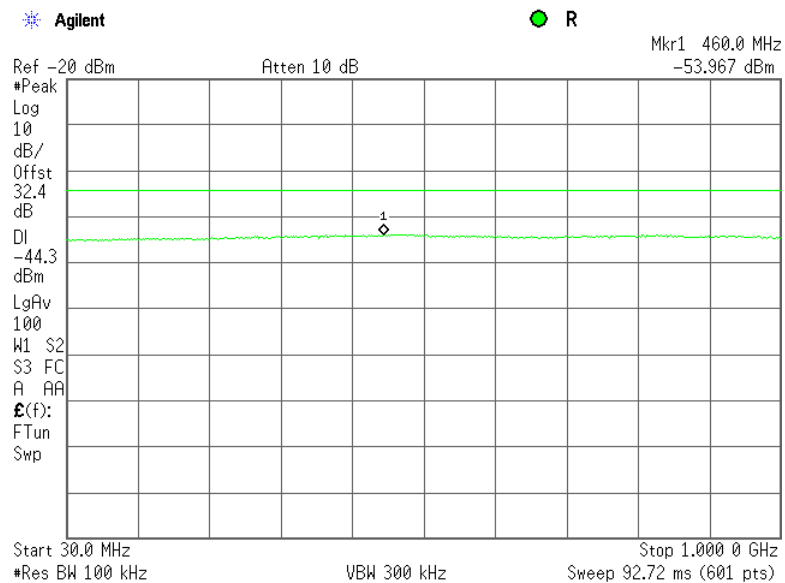
<b>Test specification:</b>		<b>FCC section 15.247(d), Conducted spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01, section 5.4	
<b>Test mode:</b>		<b>Verdict:</b>	
Compliance		PASS	
<b>Date(s):</b>		9/11/2012	
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.3.13 Spurious emission measurements in 0.15 - 30 MHz range at mid carrier frequency



Note: the -13.9 dBm limit shall be applied

Plot 7.3.14 Spurious emission measurements in 30 - 1000 MHz range at mid carrier frequency

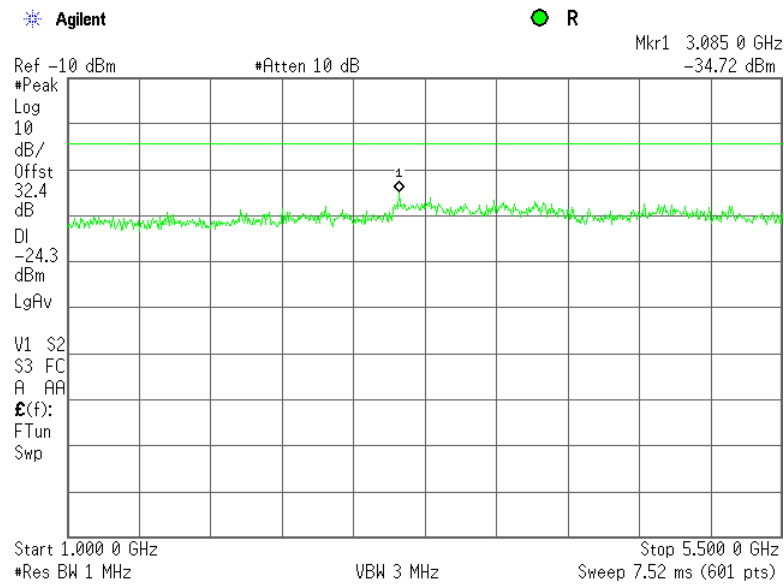


Note: the -13.9 dBm limit shall be applied



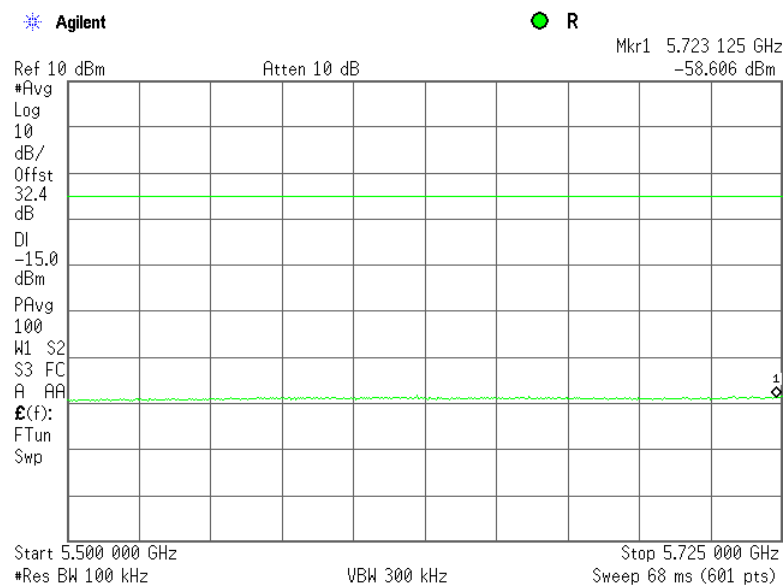
<b>Test specification:</b>		<b>FCC section 15.247(d), Conducted spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01, section 5.4	
<b>Test mode:</b>		<b>Verdict:</b>	
Compliance		PASS	
<b>Date(s):</b>		9/11/2012	
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.3.15 Spurious emission measurements in 1000 – 55000 MHz range at mid carrier frequency



Note: the -13.9 dBm limit shall be applied

Plot 7.3.16 Spurious emission measurements in 5500 – 5725 MHz range at mid carrier frequency

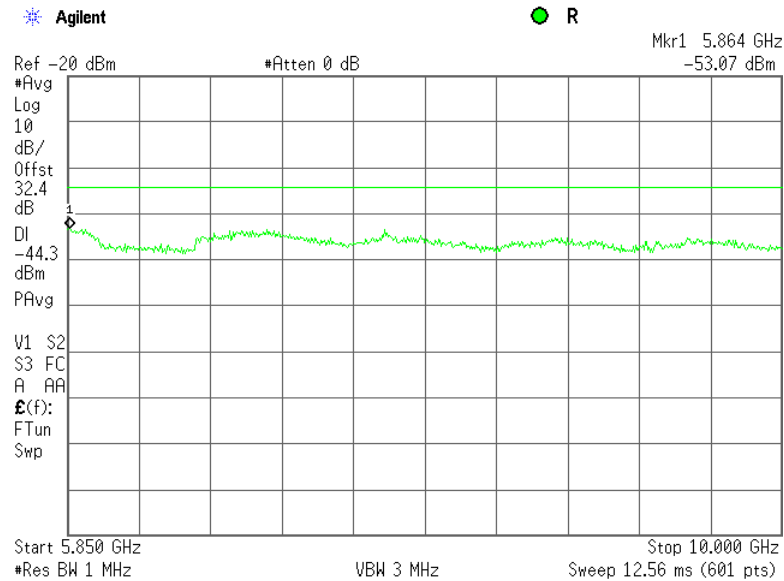


Note: the -13.9 dBm limit shall be applied



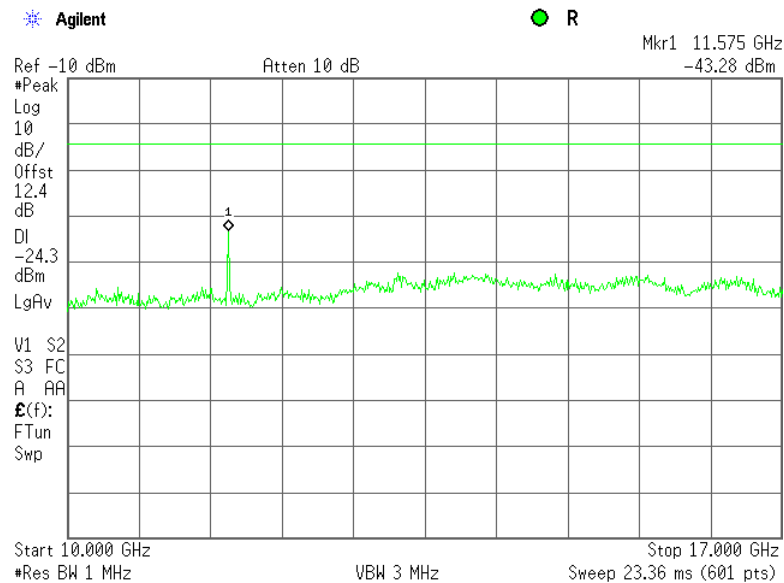
<b>Test specification:</b>		<b>FCC section 15.247(d), Conducted spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01, section 5.4	
<b>Test mode:</b>		<b>Verdict:</b>	
Compliance		PASS	
<b>Date(s):</b>		9/11/2012	
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.3.17 Spurious emission measurements in 5850 – 10000 MHz range at mid carrier frequency



Note: the -13.9 dBm limit shall be applied

Plot 7.3.18 Spurious emission measurements in 10000 – 17000 MHz range at mid carrier frequency

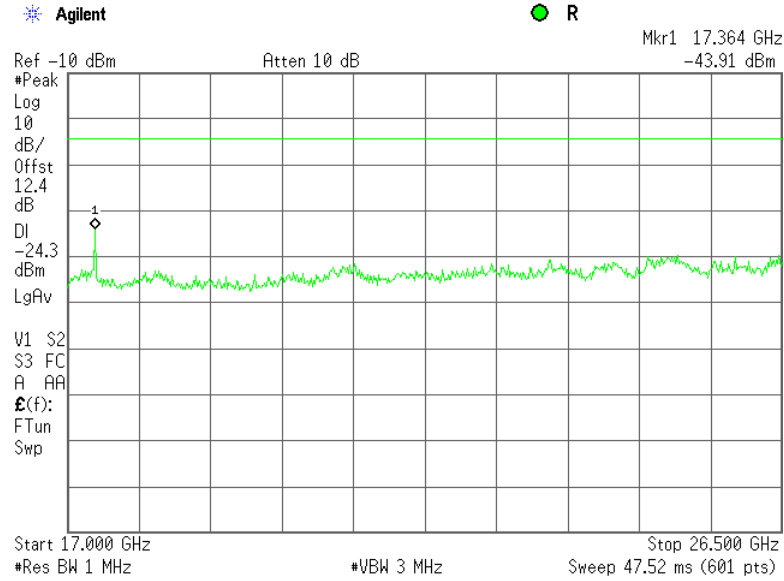


Note: the -13.9 dBm limit shall be applied



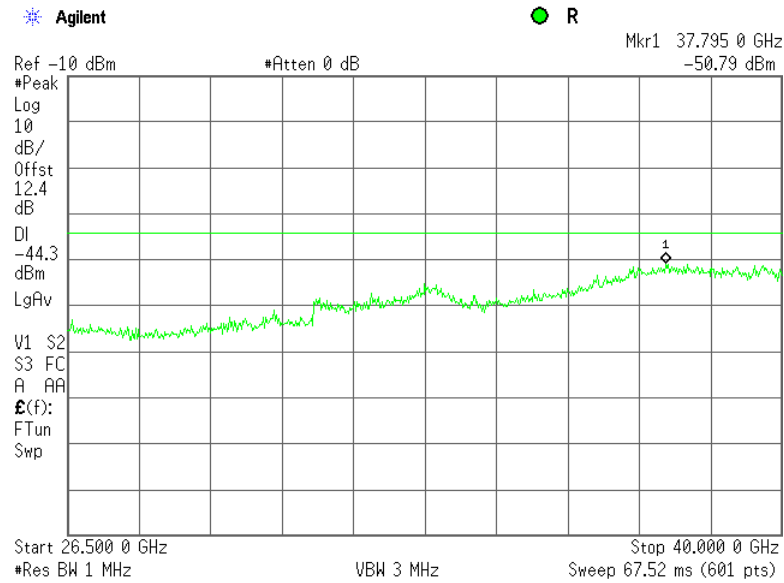
<b>Test specification:</b> FCC section 15.247(d), Conducted spurious emissions	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01, section 5.4	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 9/11/2012	
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa
	<b>Relative Humidity:</b> 48 %
	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>	

Plot 7.3.19 Spurious emission measurements in 17000 – 26500 MHz range at mid carrier frequency



Note: the -13.9 dBm limit shall be applied

Plot 7.3.20 Spurious emission measurements in 26500-40000 MHz range at mid carrier frequency



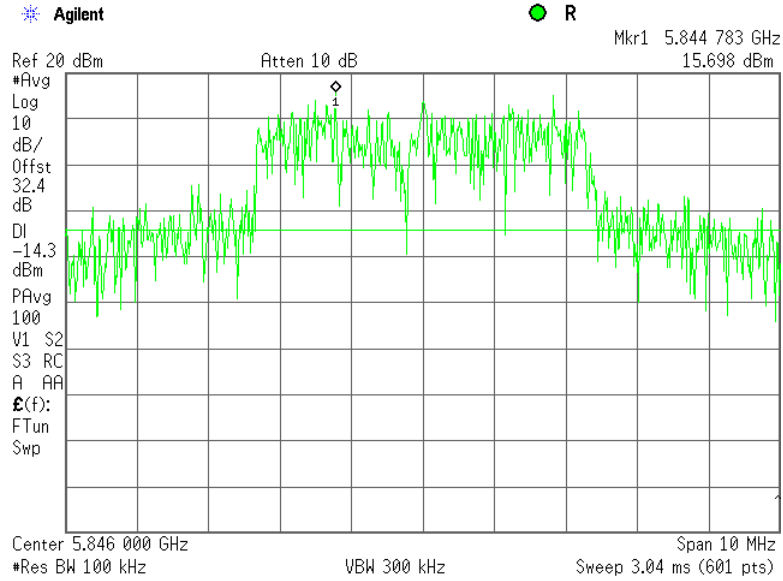
Note: the -13.9 dBm limit shall be applied





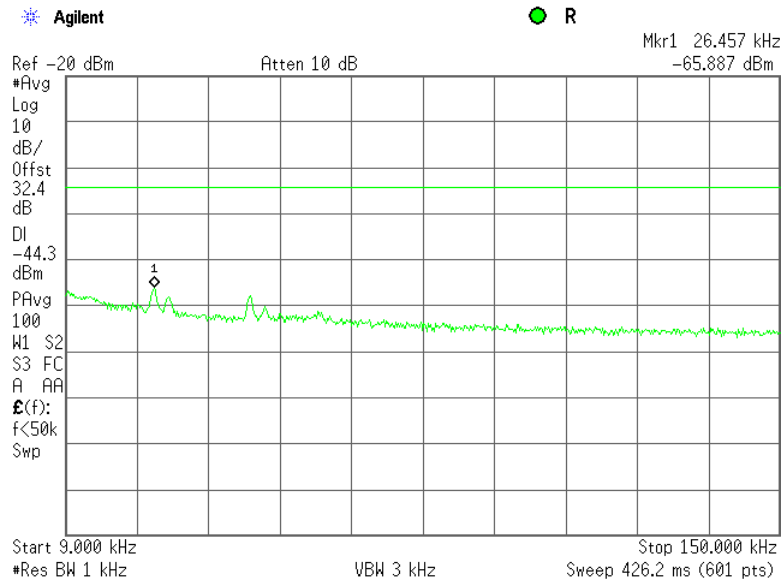
<b>Test specification:</b>		<b>FCC section 15.247(d), Conducted spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01, section 5.4	
<b>Test mode:</b>		<b>Verdict:</b>	
Compliance		PASS	
<b>Date(s):</b>		9/11/2012	
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.3.21 The highest emission level within the assigned band at high carrier frequency



DL= -14.4 dBm (15.6 dBm – 30 dB) according to 30 dBc spurious limit outside restricted band

Plot 7.3.22 Spurious emission measurements in 9 - 150 kHz range at high carrier frequency

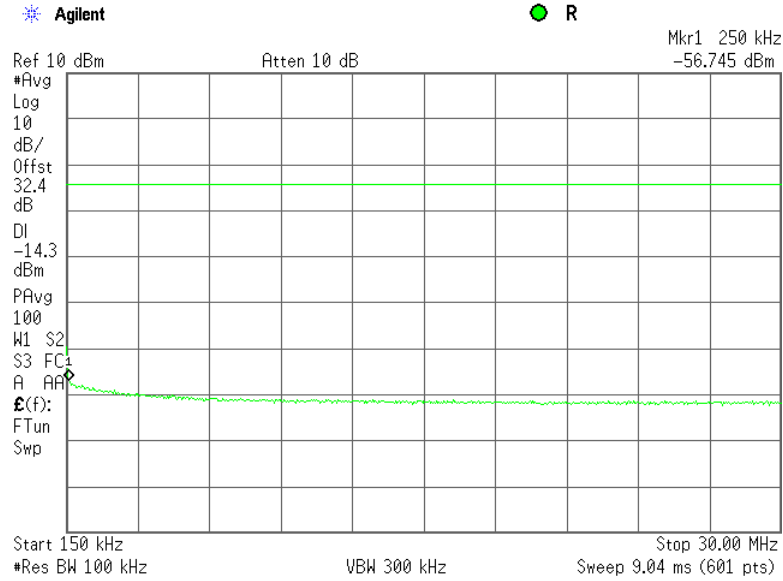


Note: the -14.4 dBm limit shall be applied

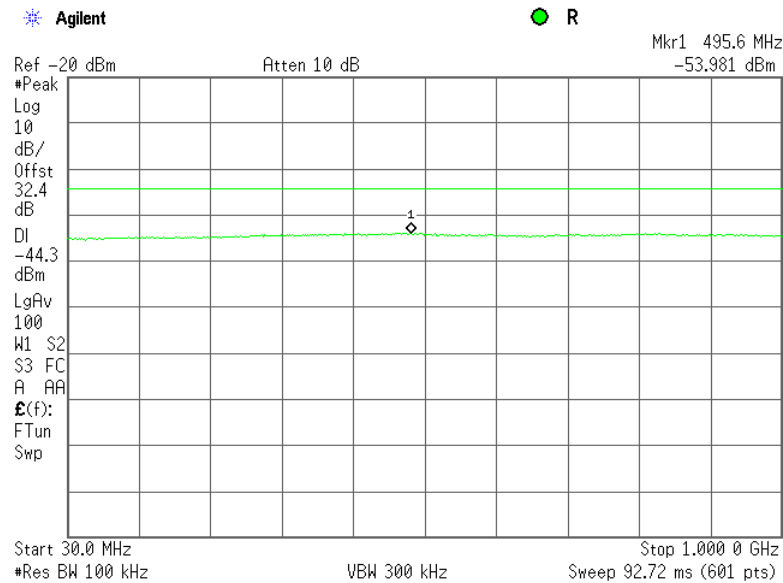


<b>Test specification:</b>		<b>FCC section 15.247(d), Conducted spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01, section 5.4	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/11/2012	
<b>Temperature:</b> 24 °C		<b>Air Pressure:</b> 1008 hPa	
		<b>Relative Humidity:</b> 48 %	
		<b>Power Supply:</b> 48 VDC	
<b>Remarks:</b>			
		<b>Verdict:</b> PASS	

Plot 7.3.23 Spurious emission measurements in 0.15 - 30 MHz range at high carrier frequency



Plot 7.3.24 Spurious emission measurements in 30 - 1000 MHz range at high carrier frequency

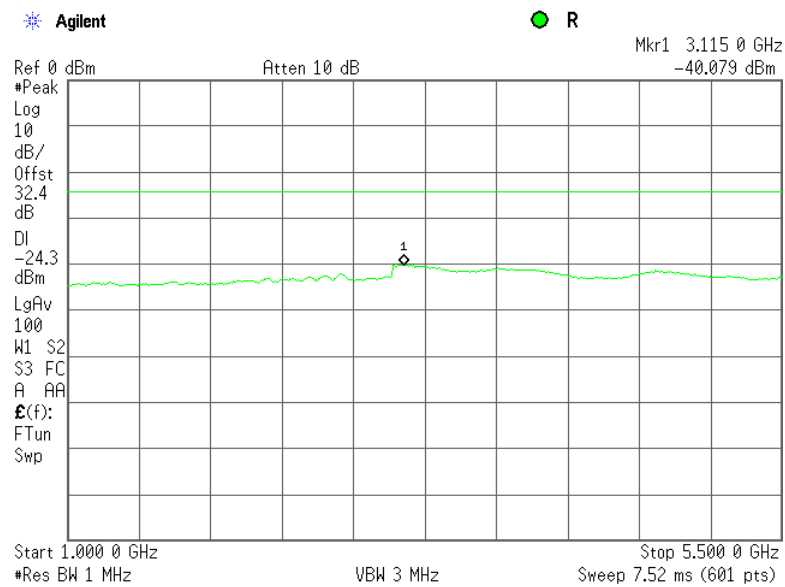


Note: the -14.4 dBm limit shall be applied



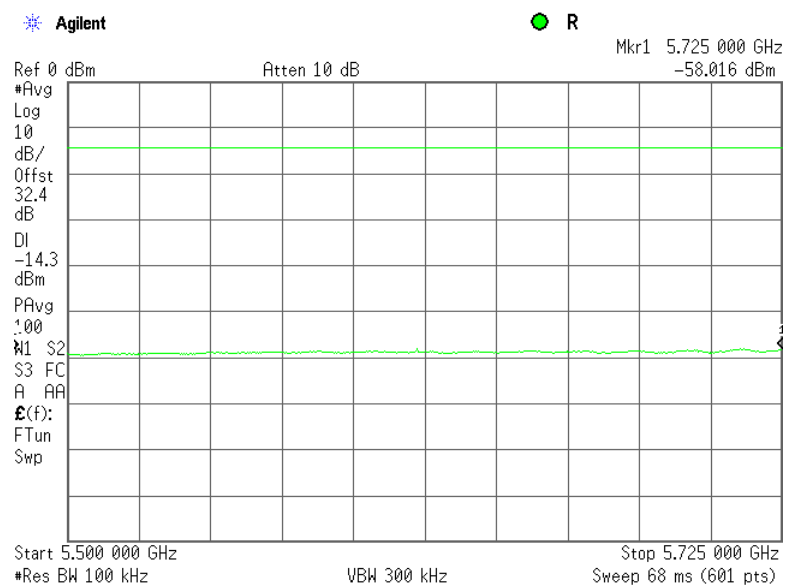
<b>Test specification:</b>		<b>FCC section 15.247(d), Conducted spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01, section 5.4	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/11/2012	
<b>Temperature: 24 °C</b>		<b>Air Pressure: 1008 hPa</b>	
<b>Relative Humidity: 48 %</b>		<b>Power Supply: 48 VDC</b>	
<b>Remarks:</b>			
		<b>Verdict: PASS</b>	

Plot 7.3.25 Spurious emission measurements in 1000 – 5500 MHz range at high carrier frequency



Note: the -14.4 dBm limit shall be applied

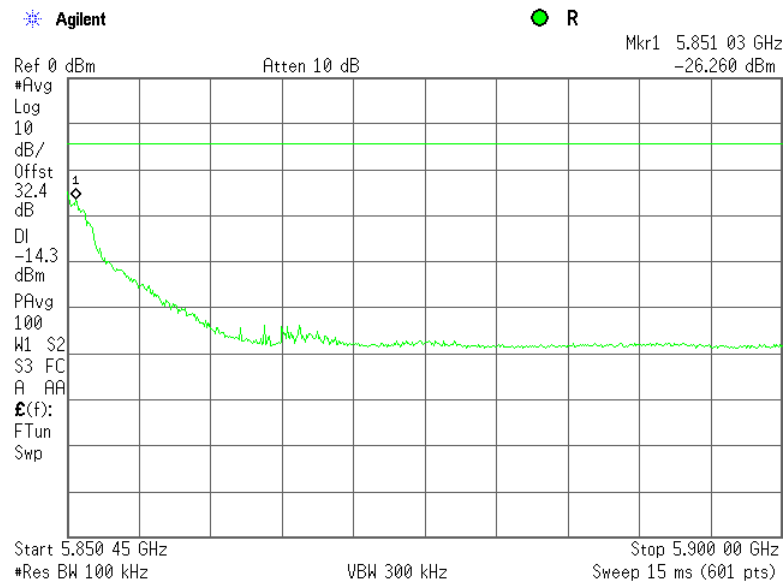
Plot 7.3.26 Spurious emission measurements in 5500 – 5725 MHz range at high carrier frequency



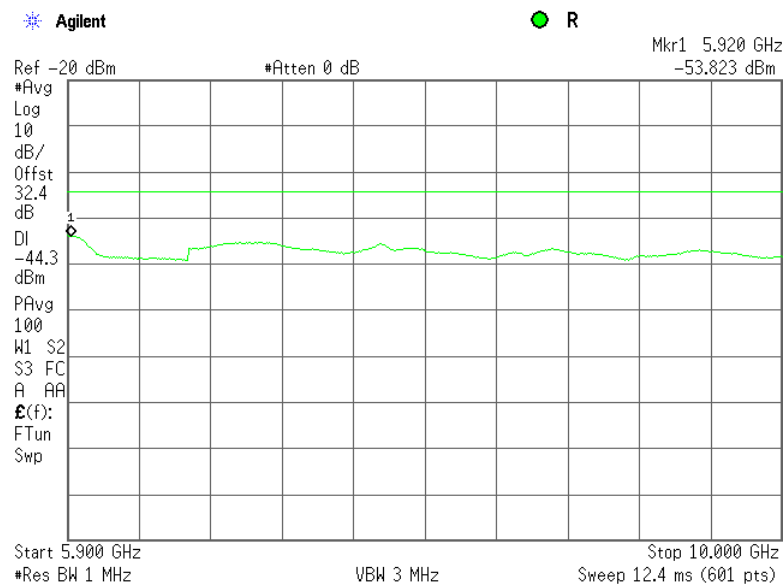


<b>Test specification:</b>		<b>FCC section 15.247(d), Conducted spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01, section 5.4	
<b>Test mode:</b>		<b>Verdict:</b>	
Compliance		PASS	
<b>Date(s):</b>		9/11/2012	
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.3.27 Spurious emission measurements in 5850.45 – 5900 MHz range at high carrier frequency



Plot 7.3.28 Spurious emission measurements in 5900-10000 MHz range at high carrier frequency

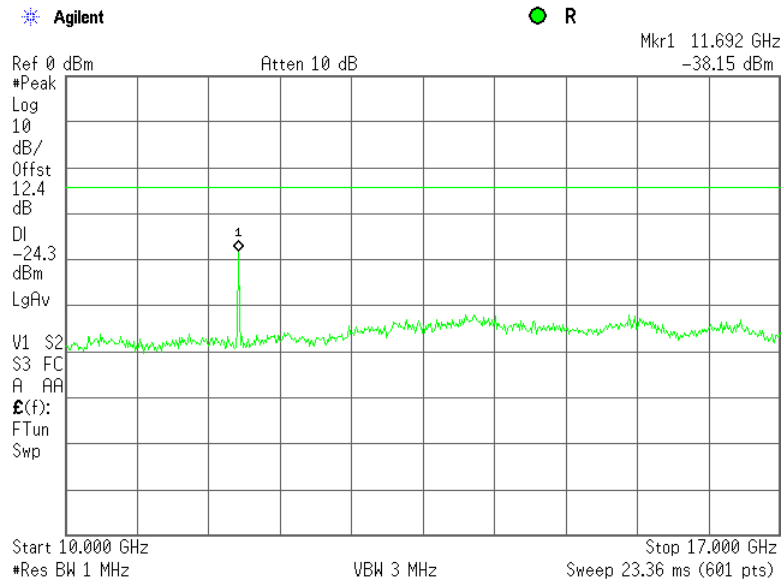


Note: the -14.4 dBm limit shall be applied



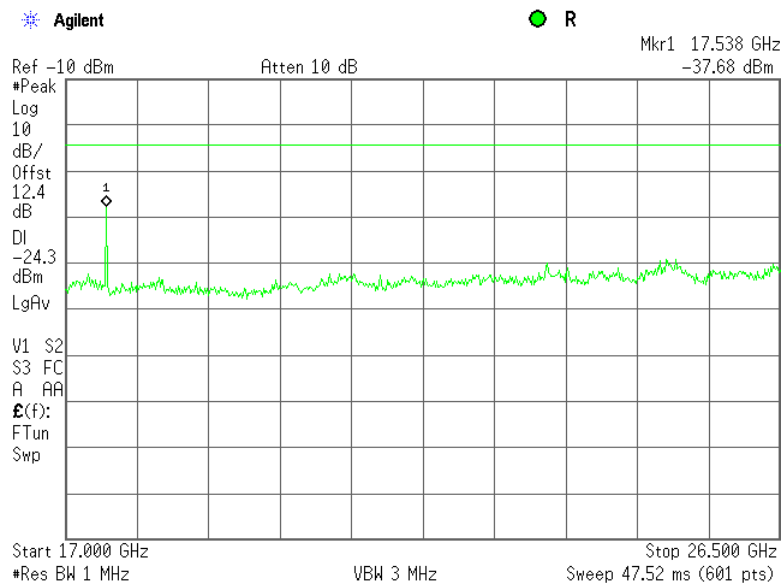
<b>Test specification:</b>		<b>FCC section 15.247(d), Conducted spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01, section 5.4	
<b>Test mode:</b>		<b>Verdict:</b> PASS	
<b>Date(s):</b>		9/11/2012	
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.3.29 Spurious emission measurements in 10000 – 17000 MHz range at high carrier frequency



Note: the -14.4 dBm limit shall be applied

Plot 7.3.30 Spurious emission measurements in 17000 – 26500 MHz range at high carrier frequency

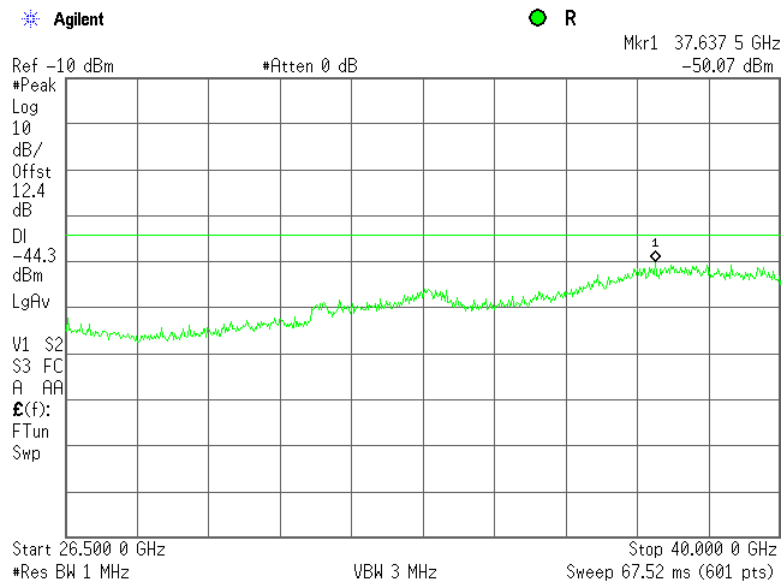


Note: the -14.4 dBm limit shall be applied



<b>Test specification:</b>		<b>FCC section 15.247(d), Conducted spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01, section 5.4	
<b>Test mode:</b>		<b>Verdict:</b>	
Compliance		PASS	
<b>Date(s):</b>		9/11/2012	
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.3.31 Spurious emission measurements in 26500-40000 MHz range at high carrier frequency



Note: the -14.4 dBm limit shall be applied



<b>Test specification:</b>		<b>FCC section 15.247(d), Radiated spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C		<b>Air Pressure:</b> 1015 hPa	
		<b>Relative Humidity:</b> 46 %	
		<b>Power Supply:</b> 48 VDC	
<b>Remarks:</b>			

## 7.4 Field strength of spurious emissions

### 7.4.1 General

This test was performed to measure field strength of spurious emissions from the EUT. Specification test limits are given in Table 7.4.1.

Table 7.4.1 Radiated spurious emissions limits

Frequency, MHz	Field strength at 3 m within restricted bands, dB(μV/m)*			Attenuation of field strength of spurious versus carrier outside restricted bands, dBc***
	Peak	Quasi Peak	Average	
0.009 – 0.090	148.5 – 128.5	NA	128.5 – 108.5**	20.0
0.090 – 0.110	NA	108.5 – 106.8**	NA	
0.110 – 0.490	126.8 – 113.8	NA	106.8 – 93.8**	
0.490 – 1.705	NA	73.8 – 63.0**	NA	
1.705 – 30.0*		69.5		
30 – 88		40.0		
88 – 216		43.5		
216 – 960		46.0		
960 - 1000		54.0		
1000 – 10 <sup>th</sup> harmonic	74.0	NA	54.0	

\*- The limit for 3 m test distance was calculated using the inverse square distance extrapolation factor as follows:  

$$\text{Lim}_{S_2} = \text{Lim}_{S_1} + 40 \log (S_1/S_2),$$
 where S<sub>1</sub> and S<sub>2</sub> – standard defined and test distance respectively in meters.

\*\* - The limit decreases linearly with the logarithm of frequency.

\*\*\* - The field strength limits applied from the lowest radio frequency generated in the device, without going below 9 kHz up to the tenth harmonic of the highest fundamental frequency.

### 7.4.2 Test procedure for spurious emission field strength measurements in 9 kHz to 30 MHz band

7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized and the performance check was conducted.

7.4.2.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360° and the measuring antenna was rotated around its vertical axis.

7.4.2.3 The worst test results (the lowest margins) were recorded and shown in the associated plots.

### 7.4.3 Test procedure for spurious emission field strength measurements above 30 MHz

7.4.3.1 The EUT was set up as shown in Figure 7.4.2, energized and the performance check was conducted.

7.4.3.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360°, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal.

7.4.3.3 The worst test results (the lowest margins) were recorded and shown in the associated plots.



<b>Test specification:</b>		<b>FCC section 15.247(d), Radiated spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b>		<b>Verdict:</b> PASS	
<b>Date(s):</b>		10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa	<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Figure 7.4.1 Setup for spurious emission field strength measurements below 30 MHz

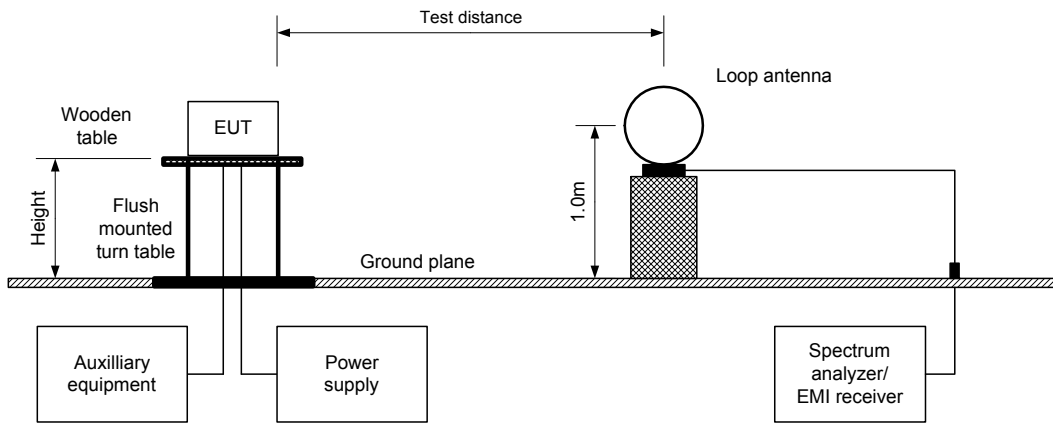
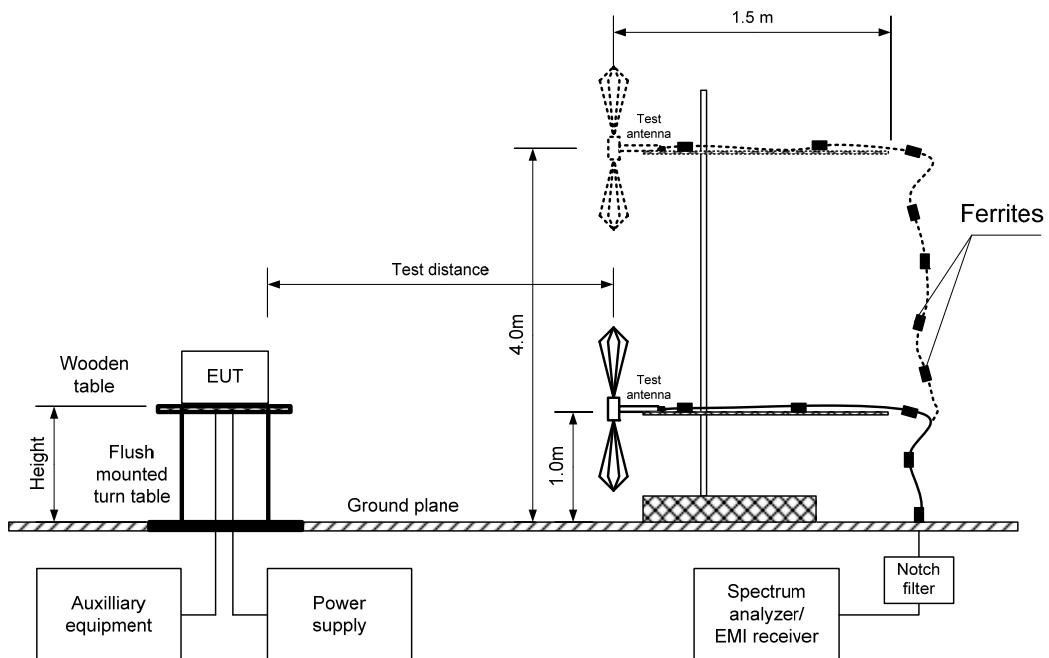


Figure 7.4.2 Setup for spurious emission field strength measurements above 30 MHz







<b>Test specification:</b>		<b>FCC section 15.247(d), Radiated spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C		<b>Air Pressure:</b> 1015 hPa	
		<b>Relative Humidity:</b> 46 %	
		<b>Power Supply:</b> 48 VDC	
<b>Remarks:</b> EUT with 9.5 dBi omnidirectional antenna			

**Table 7.4.2 Field strength of emissions outside restricted bands**

ASSIGNED FREQUENCY BAND: 5725 - 5850 MHz  
 INVESTIGATED FREQUENCY RANGE: 0.009 - 40000 MHz  
 TEST DISTANCE: 3 m  
 MODULATION: 64QAM  
 MODULATING SIGNAL: PRBS  
 BIT RATE: 23.04Mbps  
 DUTY CYCLE: 60 %  
 EMISSION BANDWIDTH: 5MHz  
 DETECTOR USED: Peak  
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum  
 TRANSMITTER OUTPUT POWER: 25.77dBm at low carrier frequency  
 26.02dBm at mid carrier frequency  
 25.09dBm at high carrier frequency  
 DETECTOR USED: Peak  
 RESOLUTION BANDWIDTH: 100 kHz  
 VIDEO BANDWIDTH: 300 kHz  
 TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)  
 Biconilog (30 MHz – 1000 MHz)  
 Double ridged guide (above 1000 MHz)

Frequency, MHz	Field strength of spurious, dB(μV/m)	Antenna polarization	Antenna height, m	Azimuth, degrees*	Field strength of carrier, dB(μV/m)	Attenuation below carrier, dBc	Limit, dBc	Margin, dB**	Verdict
<b>Low carrier frequency</b>									
No emissions were found									Pass
<b>Mid carrier frequency</b>									
No emissions were found									Pass
<b>High carrier frequency</b>									
No emissions were found									Pass

\*- EUT front panel refers to 0 degrees position of turntable.  
 \*\*- Margin = Attenuation below carrier – specification limit.

**Table 7.4.3 Restricted bands**

MHz	MHz	MHz	MHz	MHz	GHz
0.09 - 0.11	8.37625 - 8.38675	73 - 74.6	399.9 - 410	2690 - 2900	10.6 - 12.7
0.495 - 0.505	8.41425 - 8.41475	74.8 - 75.2	608 - 614	3260 - 3267	13.25 - 13.4
2.1735 - 2.1905	12.29 - 12.293	108 - 121.94	960 - 1240	3332 - 3339	14.47 - 14.5
4.125 - 4.128	12.51975 - 12.52025	123 - 138	1300 - 1427	3345.8 - 3358	15.35 - 16.2
4.17725 - 4.17775	12.57675 - 12.57725	149.9 - 150.05	1435 - 1626.5	3600 - 4400	17.7 - 21.4
4.20725 - 4.20775	13.36 - 13.41	156.52475 - 156.52525	1645.5 - 1646.5	4500 - 5150	22.01 - 23.12
6.215 - 6.218	16.42 - 16.423	156.7 - 156.9	1660 - 1710	5350 - 5460	23.6 - 24
6.26775 - 6.26825	16.69475 - 16.69525	162.0125 - 167.17	1718.8 - 1722.2	7250 - 7750	31.2 - 31.8
6.31175 - 6.31225	16.80425 - 16.80475	167.72 - 173.2	2200 - 2300	8025 - 8500	36.43 - 36.5
8.291 - 8.294	25.5 - 25.67	240 - 285	2310 - 2390	9000 - 9200	Above 38.6
8.362 - 8.366	37.5 - 38.25	322 - 335.4	2483.5 - 2500	9300 - 9500	



<b>Test specification:</b>		<b>FCC section 15.247(d), Radiated spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C		<b>Air Pressure:</b> 1015 hPa	
		<b>Relative Humidity:</b> 46 %	
		<b>Power Supply:</b> 48 VDC	
<b>Remarks:</b> EUT with 9.5 dBi omnidirectional antenna			

**Table 7.4.4 Field strength of spurious emissions above 1 GHz within restricted bands**

ASSIGNED FREQUENCY BAND: 5725 - 5850 MHz  
 INVESTIGATED FREQUENCY RANGE: 1000 - 40000 MHz  
 TEST DISTANCE: 3 m  
 MODULATION: 64QAM  
 MODULATING SIGNAL: PRBS  
 BIT RATE: 23.04Mbps  
 DUTY CYCLE: 60 %  
 EMISSION BANDWIDTH: 5MHz  
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum  
 TRANSMITTER OUTPUT POWER: 25.77dBm at low carrier frequency  
 26.02dBm at mid carrier frequency  
 25.09dBm at high carrier frequency  
 RESOLUTION BANDWIDTH: 1000 kHz  
 TEST ANTENNA TYPE: Double ridged guide

Frequency, MHz	Antenna		Azimuth, degrees*	Peak field strength(VBW=3 MHz)			Average field strength(VBW=10 Hz)				Verdict
	Polarization	Height, m		Measured, dB(µV/m)	Limit, dB(µV/m)	Margin, dB**	Measured, dB(µV/m)	Calculated, dB(µV/m)	Limit, dB(µV/m)	Margin, dB***	
<b>Low carrier frequency</b>											
11456.11	Vert	1.0	185	51.72	74.0	-22.3	43.3	38.18	54.0	-15.82	Pass
<b>Mid carrier frequency</b>											
11575.00	Vert	1.0	160	53.32	74.0	-20.7	48.48	43.36	54.0	-10.64	Pass
<b>High carrier frequency</b>											
11693.00	Vert	1.0	155	55.04	74.0	-19.0	51.86	46.74	54.0	-7.26	Pass

\*- EUT front panel refers to 0 degrees position of turntable.  
 \*\*- Margin = Measured field strength - specification limit.  
 \*\*\*- Margin = Calculated field strength - specification limit,  
 where Calculated field strength = Measured field strength + average factor.

**Table 7.4.5 Average factor calculation**

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
2.788	5.029	NA	NA	NA	-5.12

\*- Average factor was calculated as follows

for pulse train shorter than 100 ms: 
$$Average\ factor = 20 \times \log_{10} \left( \frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{Train\ duration} \times Number\ of\ bursts\ within\ pulse\ train \right)$$

for pulse train longer than 100 ms: 
$$Average\ factor = 20 \times \log_{10} \left( \frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{100\ ms} \times Number\ of\ bursts\ within\ 100\ ms \right)$$



<b>Test specification:</b>		<b>FCC section 15.247(d), Radiated spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C		<b>Air Pressure:</b> 1015 hPa	
<b>Relative Humidity:</b> 46 %		<b>Power Supply:</b> 48 VDC	
<b>Remarks:</b> EUT with 9.5 dBi omnidirectional antenna			
<b>Verdict:</b>		<b>PASS</b>	

**Table 7.4.6 Field strength of spurious emissions below 1 GHz within restricted bands**

ASSIGNED FREQUENCY BAND: 5725 - 5850 MHz  
 INVESTIGATED FREQUENCY RANGE: 0.009 – 1000 MHz  
 TEST DISTANCE: 3 m  
 MODULATION: 64QAM  
 MODULATING SIGNAL: PRBS  
 BIT RATE: 23.04Mbps  
 DUTY CYCLE: 60 %  
 EMISSION BANDWIDTH: 5MHz  
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum  
 RESOLUTION BANDWIDTH: 1.0 kHz (9 kHz – 150 kHz)  
 9.0 kHz (150 kHz – 30 MHz)  
 120 kHz (30 MHz – 1000 MHz)  
 VIDEO BANDWIDTH: > Resolution bandwidth  
 TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)  
 Biconilog (30 MHz – 1000 MHz)

Frequency, MHz	Peak emission, dB(µV/m)	Quasi-peak			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(µV/m)	Limit, dB(µV/m)	Margin, dB*				
<b>Low carrier frequency</b>								
38.229	25.9	22.6	40.0	-17.4	Vert	1.0	0	Pass
128.959	35.6	32.2	43.5	-11.3	Vert	1.0	148	
274.989	39.3	36.7	46.0	-9.3	Vert	1.0	10	
330.000	42.1	39.3	46.0	-6.7	Vert	1.0	0	
399.990	40.6	37.3	46.0	-8.7	Vert	1.0	124	
<b>Mid carrier frequency</b>								
38.229	25.9	22.6	40.0	-17.4	Vert	1.0	0	Pass
130.747	35.4	32.5	43.5	-11.0	Vert	1.0	152	
275.000	40.5	38.8	46.0	-7.2	Vert	1.0	45	
329.991	42.2	39.5	46.0	-6.5	Vert	1.0	18	
399.994	37.7	34.4	46.0	-11.6	Vert	1.0	119	
<b>High carrier frequency</b>								
38.229	25.9	22.6	40.0	-17.4	Vert	1.0	0	Pass
130.540	37.0	33.0	43.5	-10.5	Vert	1.0	168	
275.000	37.0	35.0	46.0	-11.0	Vert	1.0	70	
329.991	38.5	35.1	46.0	-10.9	Vert	1.0	35	
399.994	39.5	37.2	46.0	-8.8	Vert	1.0	94	

\*- Margin = Measured emission - specification limit.  
 \*\*- EUT front panel refer to 0 degrees position of turntable.

**Reference numbers of test equipment used**

HL 0446	HL 0521	HL 0604	HL 0768	HL 0769	HL 1984	HL 2909	HL 3533
HL 3535	HL 3818	HL 3901	HL 4114	HL 4276	HL 4352	HL 4353	

Full description is given in Appendix A.



HERMON LABORATORIES

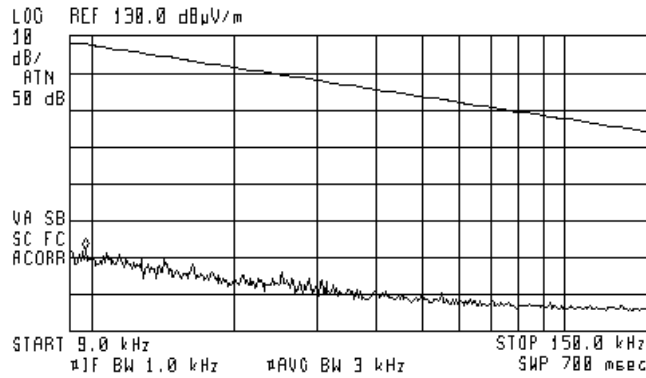
<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions			
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 10/24/2012 - 10/25/2012			
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa	<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 9.5 dBi omnidirectional antenna			

Plot 7.4.1 Radiated emission measurements from 9 to 150 kHz at the low carrier frequency

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical



ACTV DET: PEAK  
MERS DET: PEAK OP AVG  
MKR 9.8 kHz  
72.16 dBµV/m

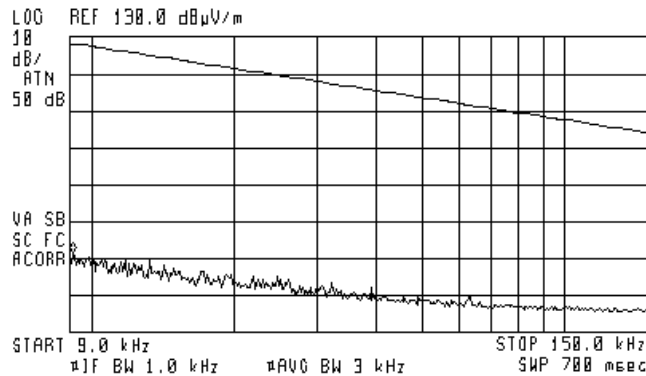


Plot 7.4.2 Radiated emission measurements from 9 to 150 kHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical



ACTV DET: PEAK  
MERS DET: PEAK OP AVG  
MKR 9.2 kHz  
71.42 dBµV/m





HERMON LABORATORIES

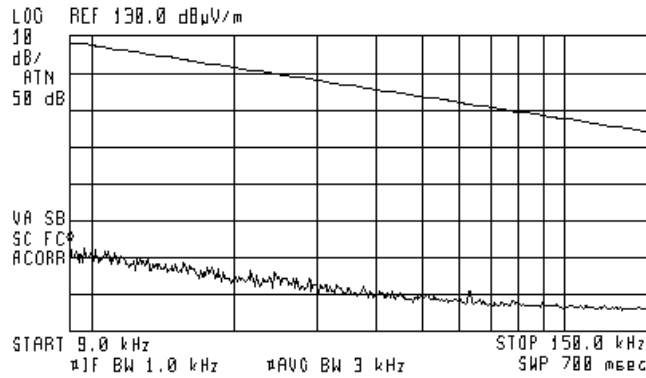
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<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 10/24/2012 - 10/25/2012			
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa	<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 9.5 dBi omnidirectional antenna			

Plot 7.4.3 Radiated emission measurements from 9 to 150 kHz at the high carrier frequency

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical



ACTV DET: PEAK  
MERS DET: PEAK OP AVG  
MFR 9.0 kHz  
74.41 dBµV/m

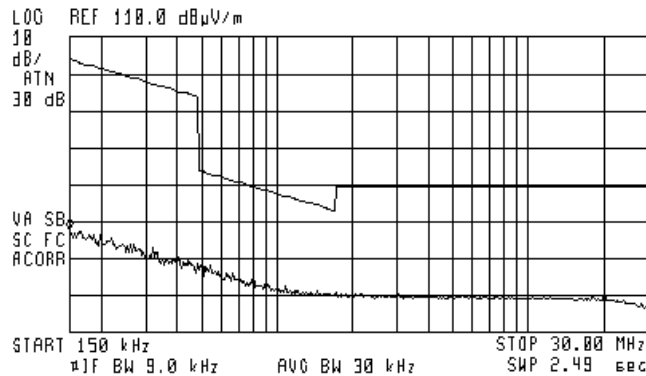


Plot 7.4.4 Radiated emission measurements from 0.15 to 30 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical



ACTV DET: PEAK  
MERS DET: PEAK OP AVG  
MFR 150 kHz  
57.82 dBµV/m





HERMON LABORATORIES

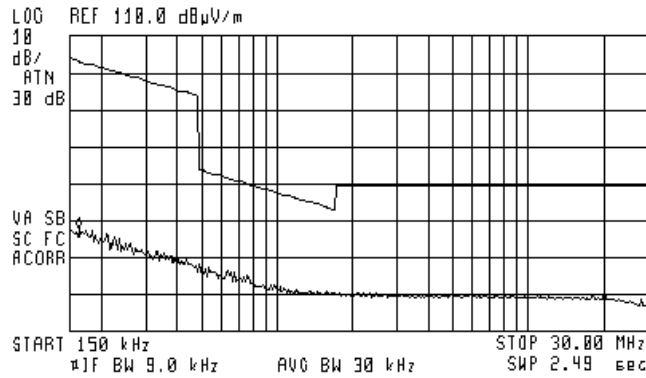
<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions			
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 10/24/2012 - 10/25/2012			
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa	<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 9.5 dBi omnidirectional antenna			

**Plot 7.4.5 Radiated emission measurements from 0.15 to 30 MHz at the mid carrier frequency**

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical



ACTV DET: PEAK  
MERS DET: PEAK OP AVG  
MKR 160 kHz  
58.00 dBµV/m

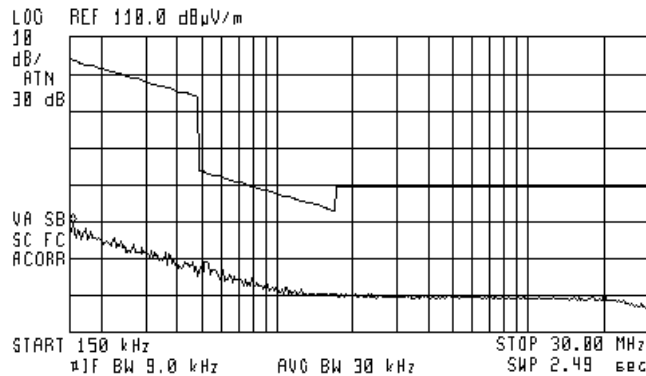


**Plot 7.4.6 Radiated emission measurements from 0.15 to 30 MHz at the high carrier frequency**

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical



ACTV DET: PEAK  
MERS DET: PEAK OP AVG  
MKR 150 kHz  
59.34 dBµV/m



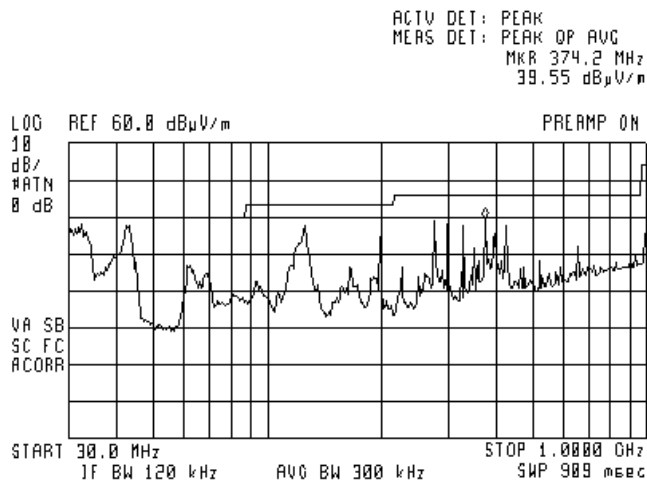


HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa
<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 9.5 dBi omnidirectional antenna	

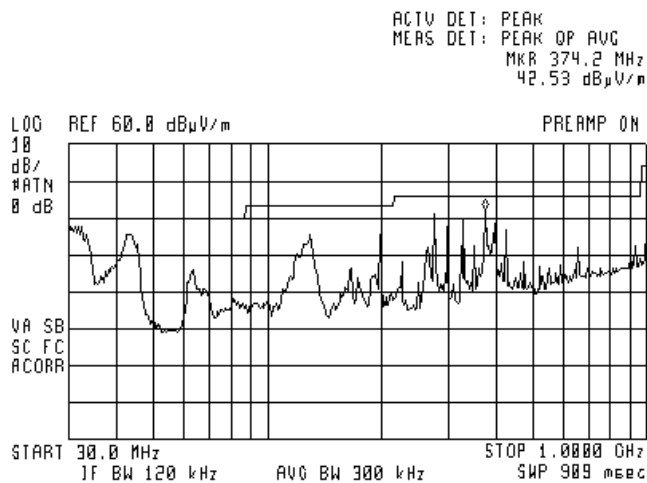
**Plot 7.4.7 Radiated emission measurements from 30 to 1000 MHz at the low carrier frequency**

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical and Horizontal



**Plot 7.4.8 Radiated emission measurements from 30 to 1000 MHz at the mid carrier frequency**

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical and Horizontal





HERMON LABORATORIES

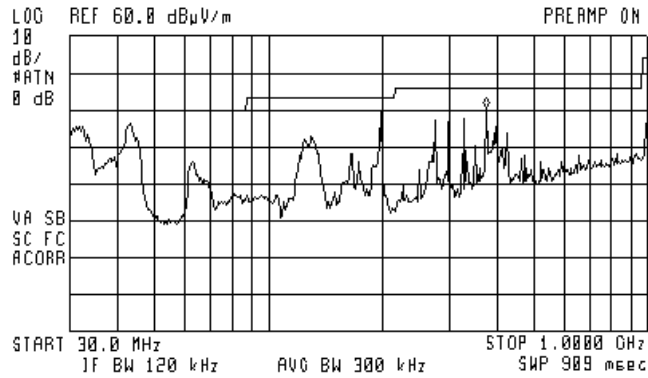
<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions			
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 10/24/2012 - 10/25/2012			
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa	<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 9.5 dBi omnidirectional antenna			

**Plot 7.4.9 Radiated emission measurements from 30 to 1000 MHz at the high carrier frequency**

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical and Horizontal



ACTV DET: PEAK  
MEAS DET: PEAK OP AVG  
MKR 374.2 MHz  
40.64 dBµV/m







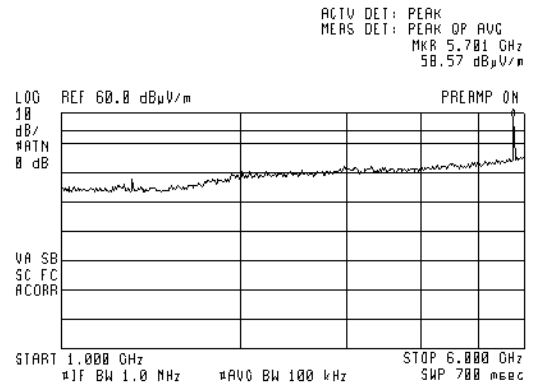
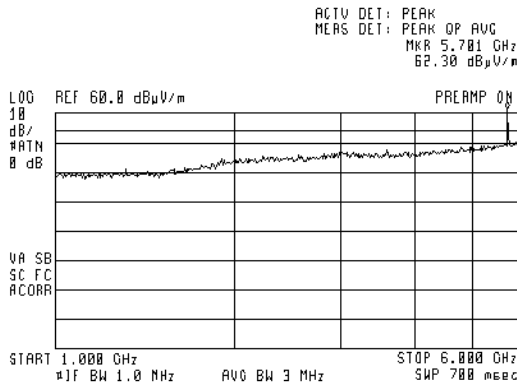
HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa
<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 9.5 dBi omnidirectional antenna	

Plot 7.4.10 Radiated emission measurements from 1000 to 6000 MHz at the low carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

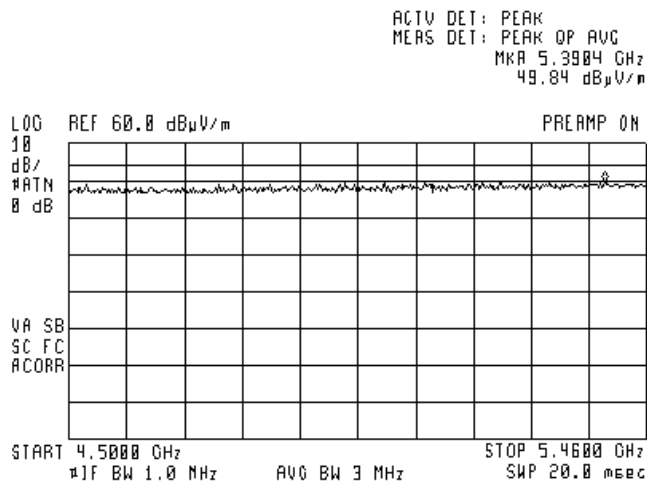
Semi anechoic chamber  
3 m  
Vertical and Horizontal  
DETECTOR: Average



Plot 7.4.11 Radiated emission measurements from 4550 to 5460 MHz at the low carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:

Semi anechoic chamber  
3 m  
Vertical and Horizontal





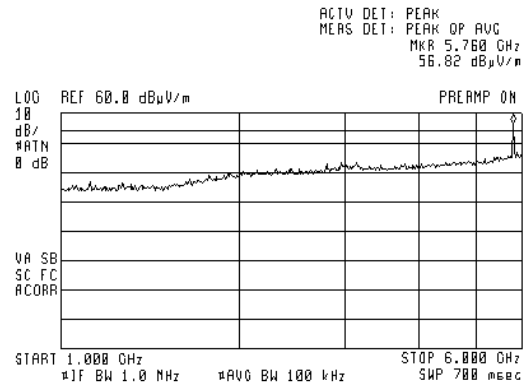
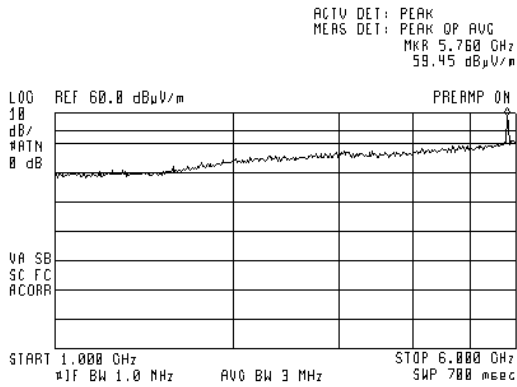
HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa
<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 9.5 dBi omnidirectional antenna	

Plot 7.4.12 Radiated emission measurements from 1000 to 6000 MHz at the mid carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

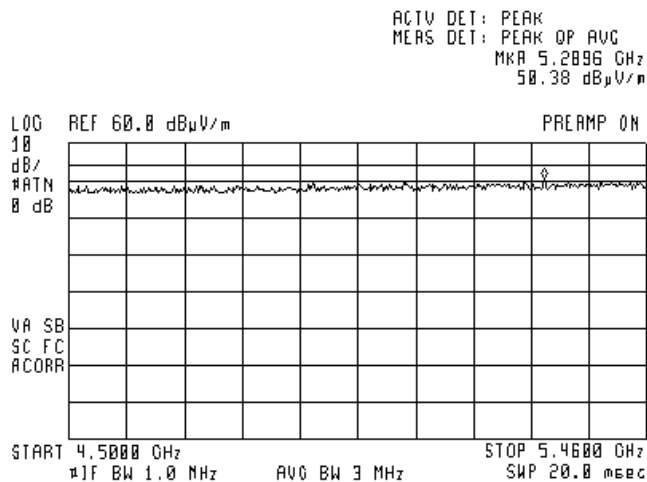
Semi anechoic chamber  
3 m  
Vertical and Horizontal  
DETECTOR: Average



Plot 7.4.13 Radiated emission measurements from 4550 to 5460 MHz at the mid carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:

Semi anechoic chamber  
3 m  
Vertical and Horizontal





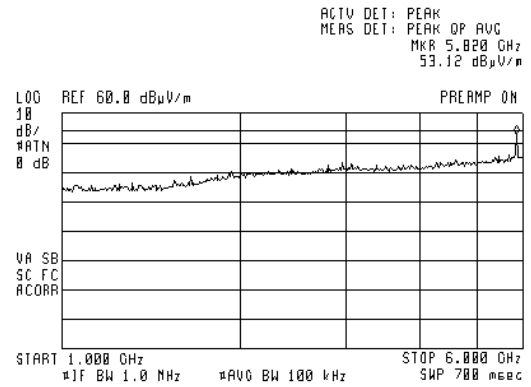
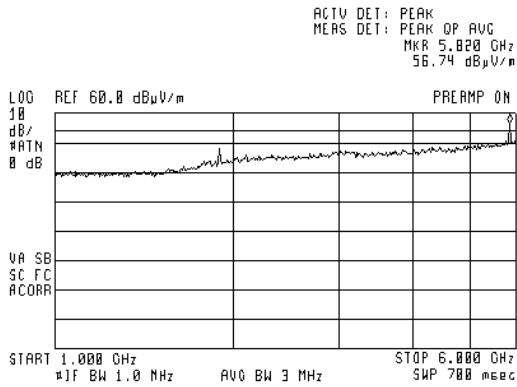
HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa
<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 9.5 dBi omnidirectional antenna	

Plot 7.4.14 Radiated emission measurements from 1000 to 6000 MHz at the high carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

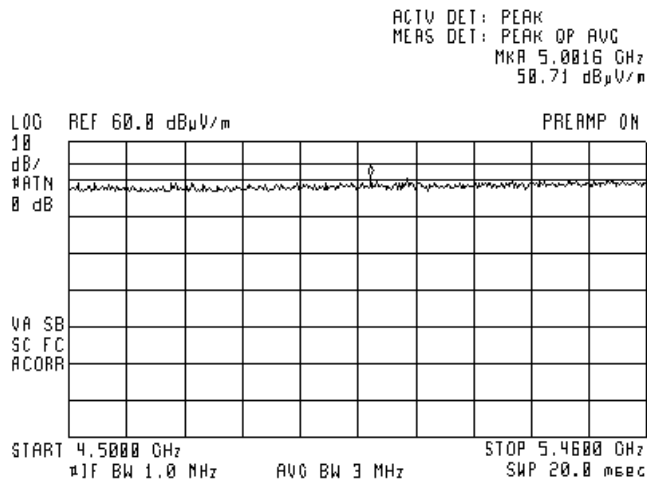
Semi anechoic chamber  
3 m  
Vertical and Horizontal  
DETECTOR: Average



Plot 7.4.15 Radiated emission measurements from 4550 to 5460 MHz at the high carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:

Semi anechoic chamber  
3 m  
Vertical and Horizontal





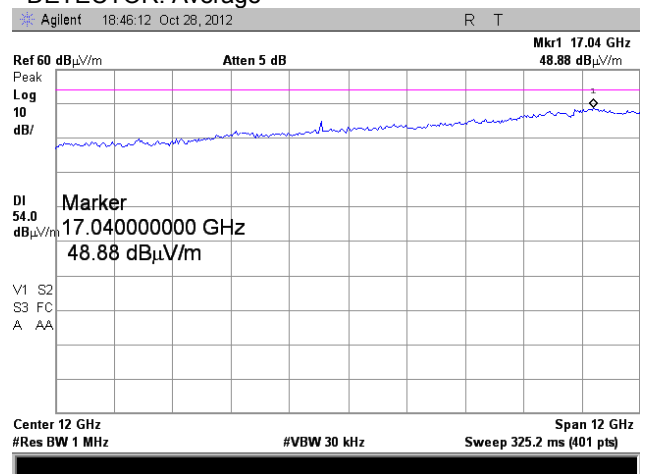
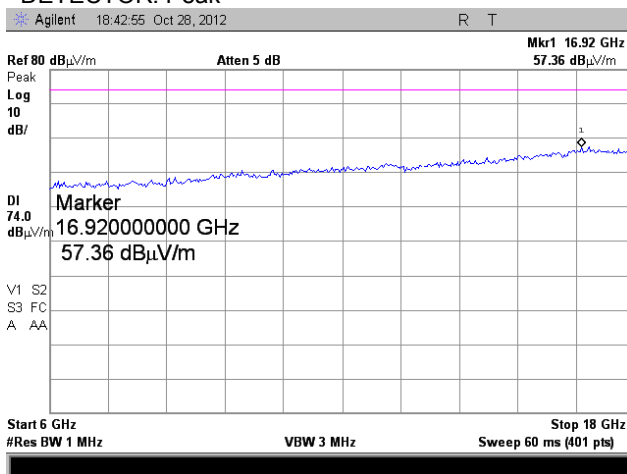
HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions			
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 10/24/2012 - 10/25/2012			
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa	<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 9.5 dBi omnidirectional antenna			

Plot 7.4.16 Radiated emission measurements from 6000 to 18000 MHz at the low carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

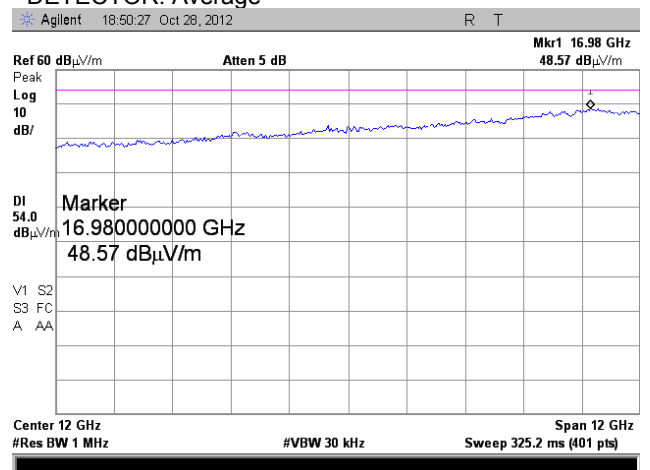
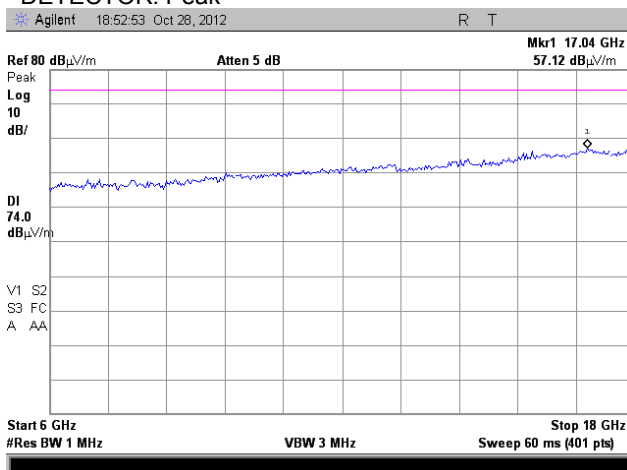
Semi anechoic chamber  
3 m  
Vertical and Horizontal  
DETECTOR: Average



Plot 7.4.17 Radiated emission measurements from 6000 to 18000 MHz at the mid carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

Semi anechoic chamber  
3 m  
Vertical and Horizontal  
DETECTOR: Average





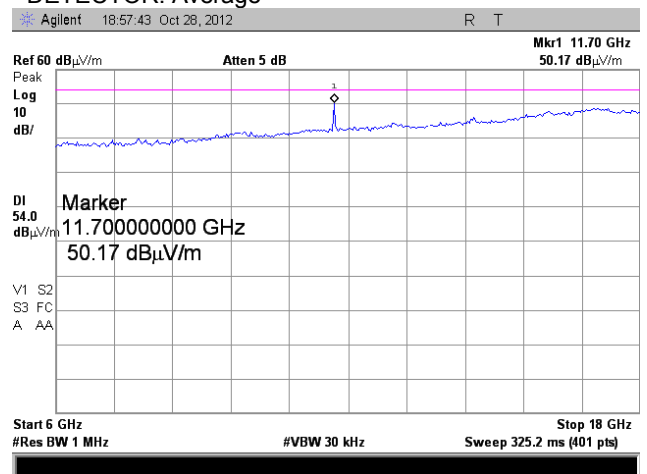
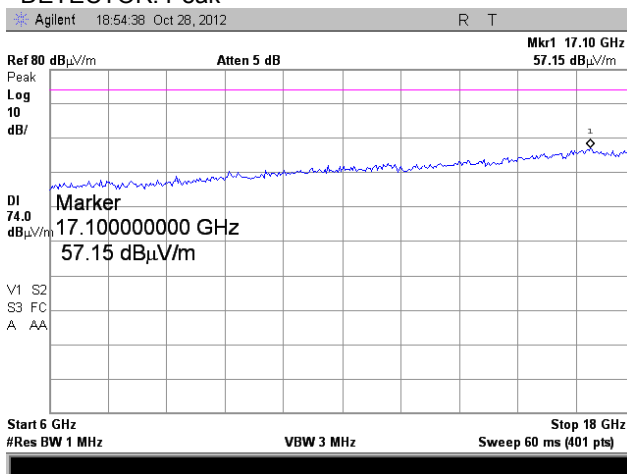
HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions			
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 10/24/2012 - 10/25/2012			
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa	<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 9.5 dBi omnidirectional antenna			

Plot 7.4.18 Radiated emission measurements from 6000 to 18000 MHz at the high carrier frequency

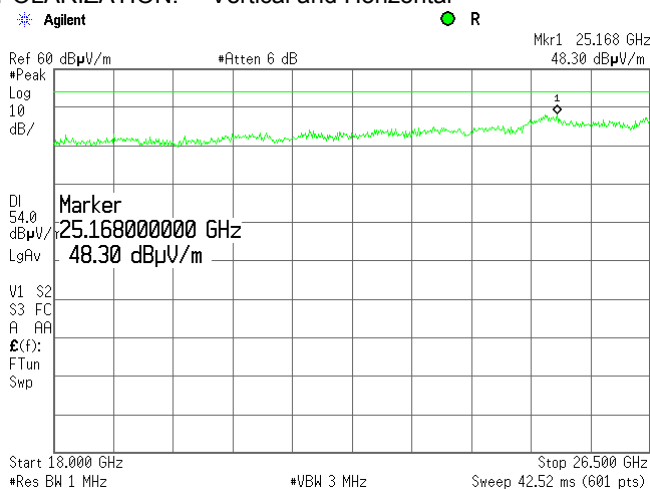
TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

Semi anechoic chamber  
3 m  
Vertical and Horizontal  
DETECTOR: Average



Plot 7.4.19 Radiated emission measurements from 18000 to 26500 MHz at the low carrier frequency

TEST SITE: OATS  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical and Horizontal



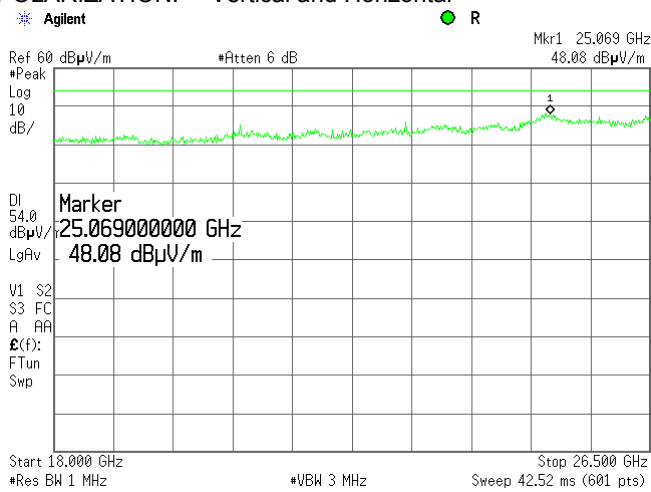


HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa
<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 9.5 dBi omnidirectional antenna	

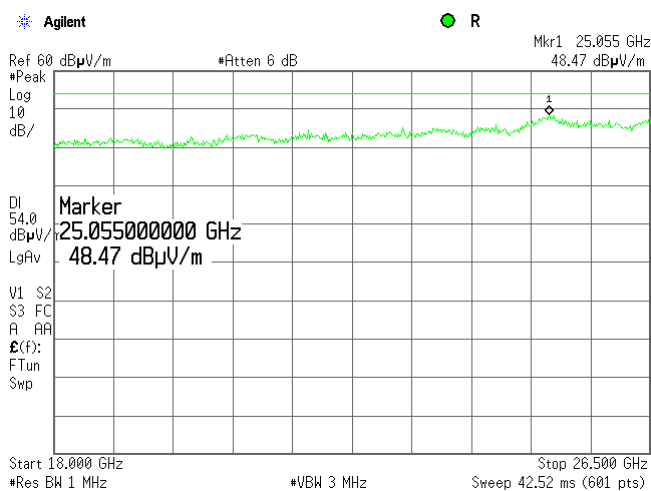
Plot 7.4.20 Radiated emission measurements from 18000 to 26500 MHz at the mid carrier frequency

TEST SITE: OATS  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.4.21 Radiated emission measurements from 18000 to 26500 MHz at the high carrier frequency

TEST SITE: OATS  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical and Horizontal





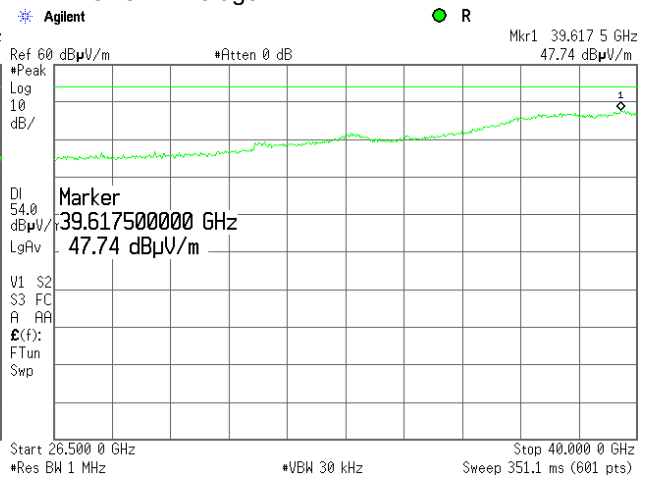
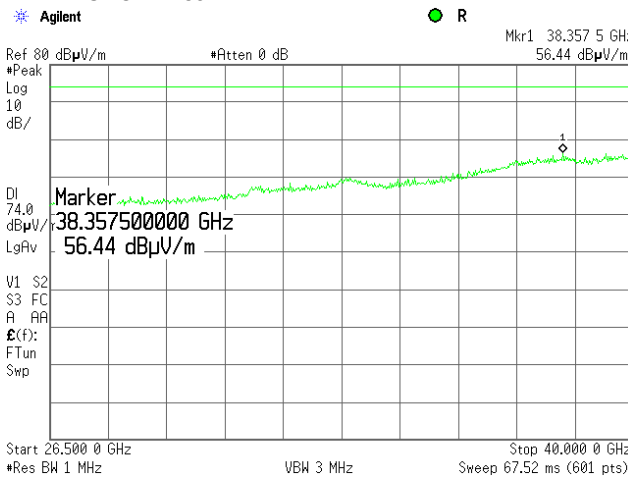
HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions			
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 10/24/2012 - 10/25/2012			
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa	<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 9.5 dBi omnidirectional antenna			

Plot 7.4.22 Radiated emission measurements from 26500 to 40000 MHz at the low carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

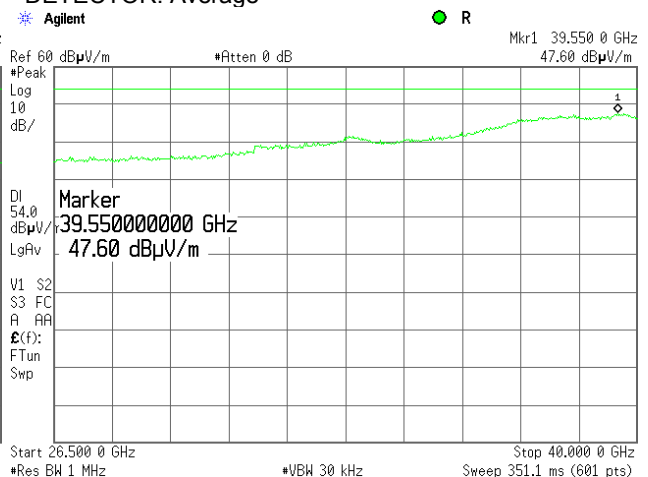
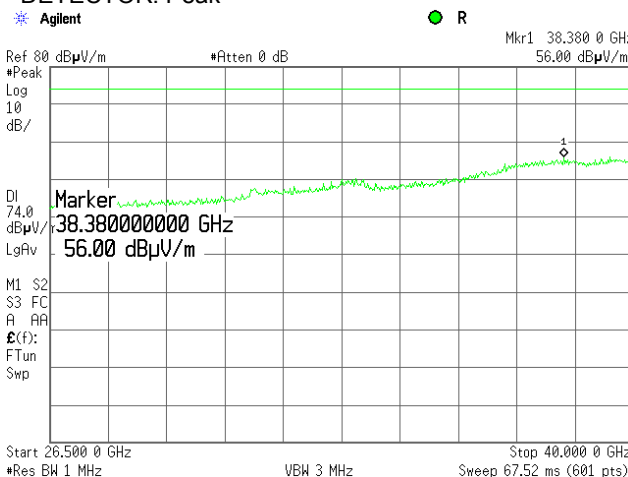
OATS  
3 m  
Vertical and Horizontal  
DETECTOR: Average



Plot 7.4.23 Radiated emission measurements from 26500 to 40000 MHz at the mid carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

OATS  
3 m  
Vertical and Horizontal  
DETECTOR: Average





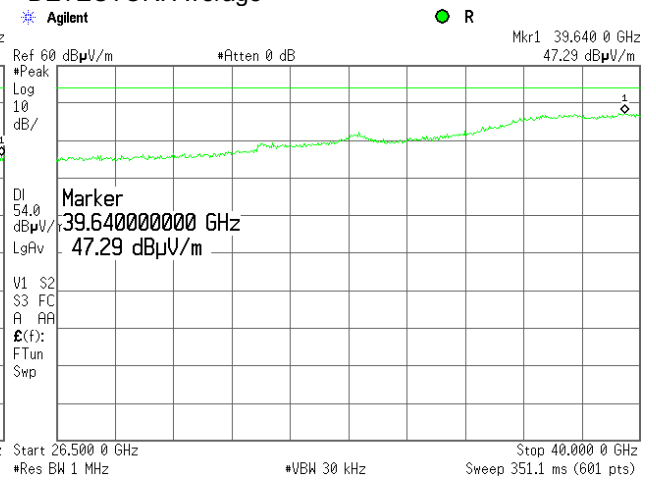
HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa
<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 9.5 dBi omnidirectional antenna	

Plot 7.4.24 Radiated emission measurements from 26500 to 40000 MHz at the high carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

OATS  
3 m  
Vertical and Horizontal  
DETECTOR: Average







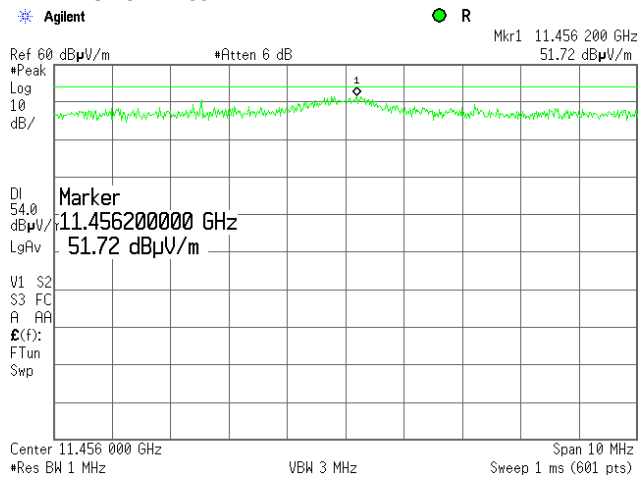
HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa
<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 9.5 dBi omnidirectional antenna	

Plot 7.4.25 Radiated emission measurements at the second harmonic of low carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

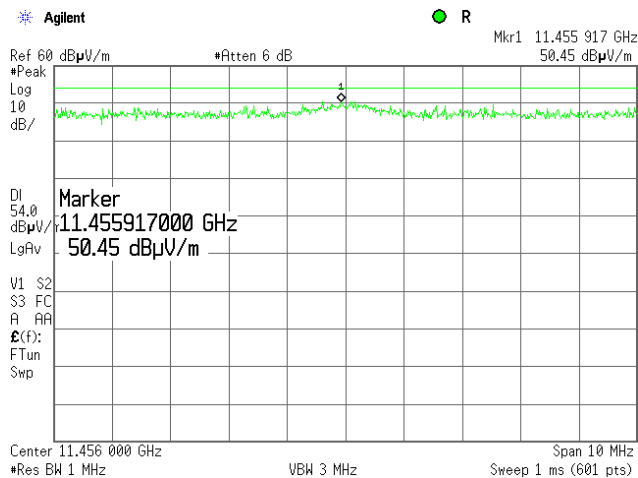
OATS  
3 m  
Vertical  
DETECTOR: Average



Plot 7.4.26 Radiated emission measurements at the second harmonic of low carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

OATS  
3 m  
Horizontal  
DETECTOR: Average





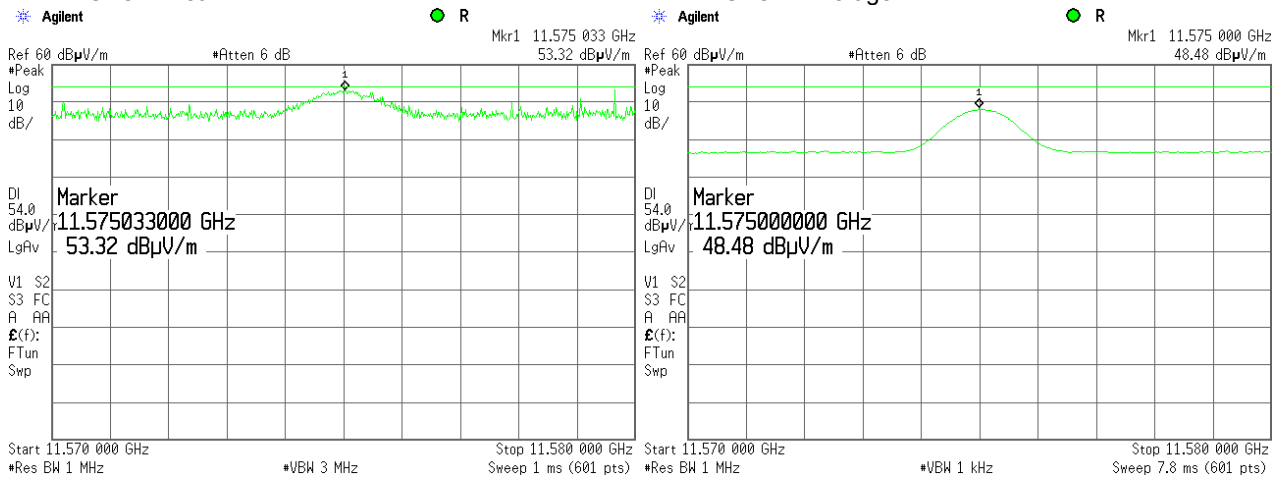
HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa
<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 9.5 dBi omnidirectional antenna	

Plot 7.4.27 Radiated emission measurements at the second harmonic of mid carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

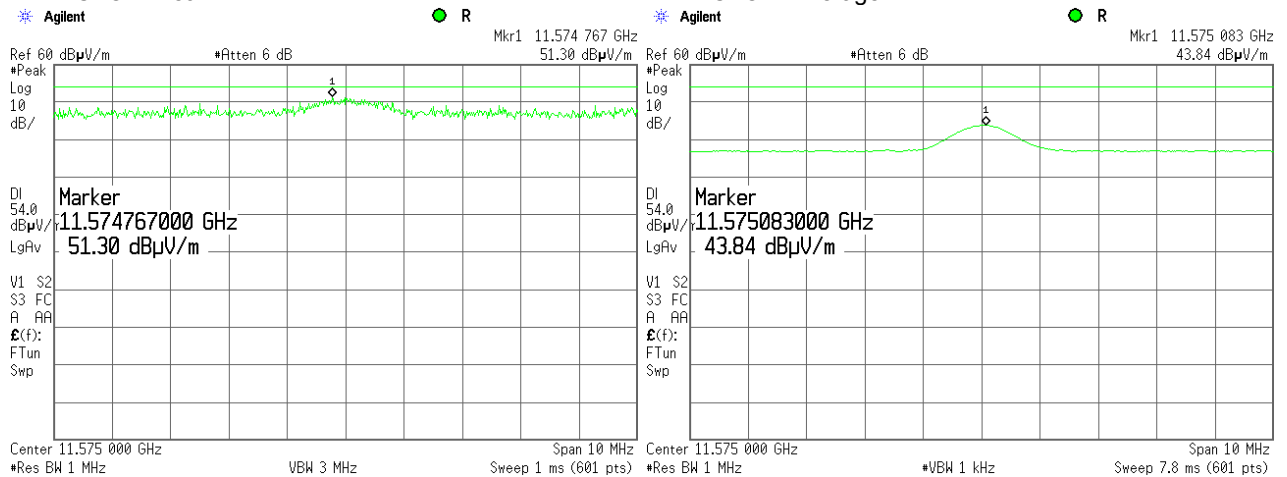
OATS  
3 m  
Vertical  
DETECTOR: Average



Plot 7.4.28 Radiated emission measurements at the second harmonic of mid carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

OATS  
3 m  
Horizontal  
DETECTOR: Average





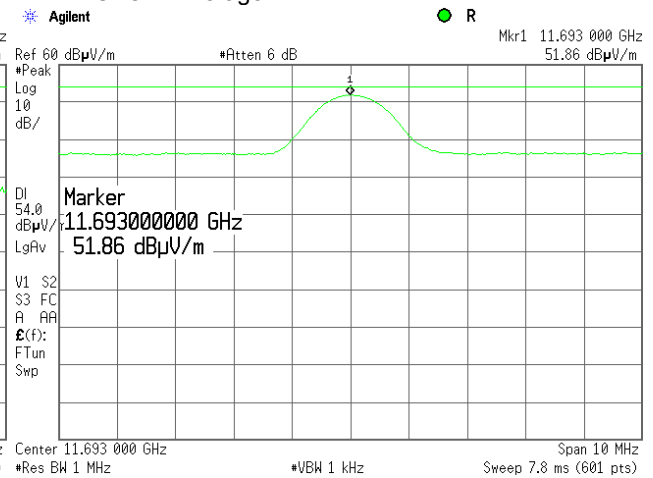
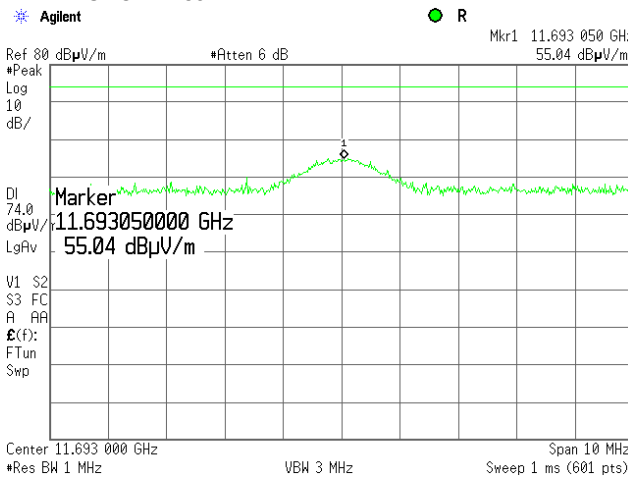
HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa
<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 9.5 dBi omnidirectional antenna	

Plot 7.4.29 Radiated emission measurements at the second harmonic of high carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

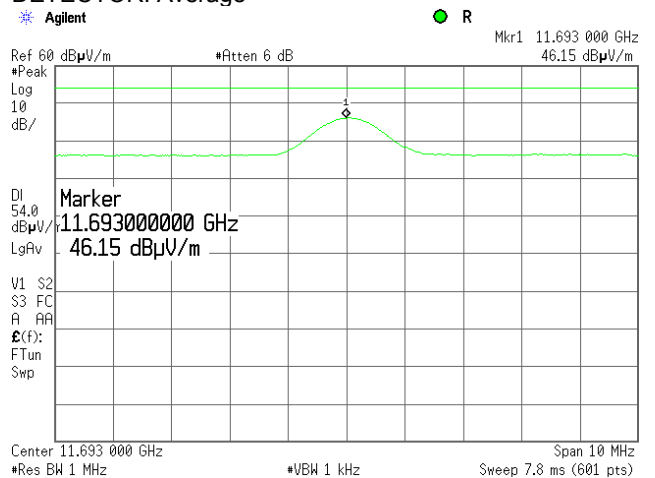
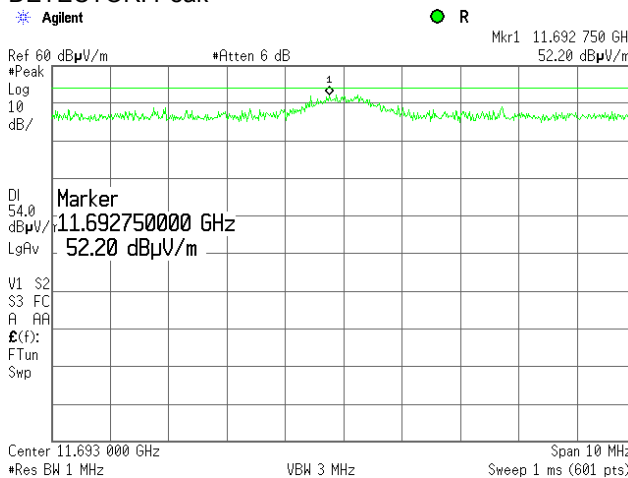
OATS  
3 m  
Vertical and Horizontal  
DETECTOR: Average



Plot 7.4.30 Radiated emission measurements at the second harmonic of high carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

OATS  
3 m  
Vertical and Horizontal  
DETECTOR: Average

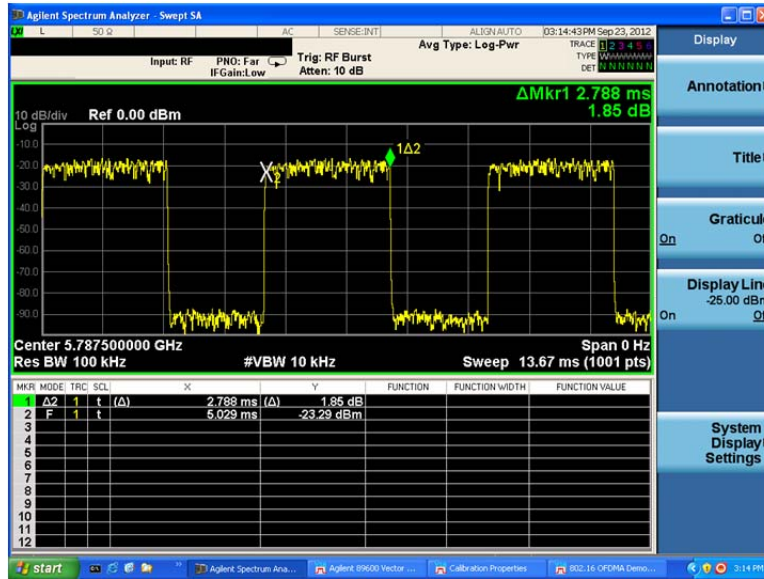




HERMON LABORATORIES

<b>Test specification:</b>		<b>FCC section 15.247(d), Radiated spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C		<b>Air Pressure:</b> 1015 hPa	
<b>Relative Humidity:</b> 46 %		<b>Power Supply:</b> 48 VDC	
<b>Remarks:</b> EUT with 9.5 dBi omnidirectional antenna			

Plot 7.4.31 Transmission pulse duration





<b>Test specification:</b>		<b>FCC section 15.247(d), Radiated spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C		<b>Air Pressure:</b> 1015 hPa	
		<b>Relative Humidity:</b> 46 %	
		<b>Power Supply:</b> 48 VDC	
<b>Remarks:</b> EUT with 16 dBi dual slant antenna			

**Table 7.4.7 Field strength of emissions outside restricted bands**

ASSIGNED FREQUENCY BAND: 5725 - 5850 MHz  
 INVESTIGATED FREQUENCY RANGE: 0.009 - 40000 MHz  
 TEST DISTANCE: 3 m  
 MODULATION: 64QAM  
 MODULATING SIGNAL: PRBS  
 BIT RATE: 23.04Mbps  
 DUTY CYCLE: 60 %  
 EMISSION BANDWIDTH: 5 MHz  
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum  
 DETECTOR USED: Peak  
 TRANSMITTER OUTPUT POWER: 25.77dBm at low carrier frequency  
 26.02dBm at mid carrier frequency  
 25.09dBm at high carrier frequency  
 RESOLUTION BANDWIDTH: 100 kHz  
 VIDEO BANDWIDTH: 300 kHz  
 TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)  
 Biconilog (30 MHz – 1000 MHz)  
 Double ridged guide (above 1000 MHz)

Frequency, MHz	Field strength of spurious, dB(µV/m)	Antenna polarization	Antenna height, m	Azimuth, degrees*	Field strength of carrier, dB(µV/m)	Attenuation below carrier, dBc	Limit, dBc	Margin, dB**	Verdict
<b>Low carrier frequency</b>									
No emissions were found									Pass
<b>Mid carrier frequency</b>									
No emissions were found									Pass
<b>High carrier frequency</b>									
No emissions were found									Pass

\*- EUT front panel refers to 0 degrees position of turntable.  
 \*\*- Margin = Attenuation below carrier – specification limit.

**Table 7.4.8 Restricted bands**

MHz	MHz	MHz	MHz	MHz	GHz
0.09 - 0.11	8.37625 - 8.38675	73 - 74.6	399.9 - 410	2690 - 2900	10.6 - 12.7
0.495 - 0.505	8.41425 - 8.41475	74.8 - 75.2	608 - 614	3260 - 3267	13.25 - 13.4
2.1735 - 2.1905	12.29 - 12.293	108 - 121.94	960 - 1240	3332 - 3339	14.47 - 14.5
4.125 - 4.128	12.51975 - 12.52025	123 - 138	1300 - 1427	3345.8 - 3358	15.35 - 16.2
4.17725 - 4.17775	12.57675 - 12.57725	149.9 - 150.05	1435 - 1626.5	3600 - 4400	17.7 - 21.4
4.20725 - 4.20775	13.36 - 13.41	156.52475 - 156.52525	1645.5 - 1646.5	4500 - 5150	22.01 - 23.12
6.215 - 6.218	16.42 - 16.423	156.7 - 156.9	1660 - 1710	5350 - 5460	23.6 - 24
6.26775 - 6.26825	16.69475 - 16.69525	162.0125 - 167.17	1718.8 - 1722.2	7250 - 7750	31.2 - 31.8
6.31175 - 6.31225	16.80425 - 16.80475	167.72 - 173.2	2200 - 2300	8025 - 8500	36.43 - 36.5
8.291 - 8.294	25.5 - 25.67	240 - 285	2310 - 2390	9000 - 9200	Above 38.6
8.362 - 8.366	37.5 - 38.25	322 - 335.4	2483.5 - 2500	9300 - 9500	



<b>Test specification:</b>		<b>FCC section 15.247(d), Radiated spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C		<b>Air Pressure:</b> 1015 hPa	
<b>Relative Humidity:</b> 46 %		<b>Power Supply:</b> 48 VDC	
<b>Remarks:</b> EUT with 16 dBi dual slant antenna			

**Table 7.4.9 Field strength of spurious emissions above 1 GHz within restricted bands**

ASSIGNED FREQUENCY BAND: 5725 - 5850 MHz  
 INVESTIGATED FREQUENCY RANGE: 1000 - 40000 MHz  
 TEST DISTANCE: 3 m  
 MODULATION: 64QAM  
 MODULATING SIGNAL: PRBS  
 BIT RATE: 23.04Mbps  
 DUTY CYCLE: 60 %  
 EMISSION BANDWIDTH: 5MHz  
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum  
 TRANSMITTER OUTPUT POWER: 25.77dBm at low carrier frequency  
 26.02dBm at mid carrier frequency  
 25.09dBm at high carrier frequency  
 RESOLUTION BANDWIDTH: 1000 kHz  
 TEST ANTENNA TYPE: Double ridged guide

Frequency, MHz	Antenna		Azimuth, degrees*	Peak field strength(VBW=3 MHz)			Average field strength(VBW=10 Hz)				Verdict
	Polarization	Height, m		Measured, dB(µV/m)	Limit, dB(µV/m)	Margin, dB**	Measured, dB(µV/m)	Calculated, dB(µV/m)	Limit, dB(µV/m)	Margin, dB***	
<b>Low carrier frequency</b>											
11456.00	Vert	1.0	180	53.26	74.0	-20.7	44.78	39.66	54.0	-14.34	Pass
<b>Mid carrier frequency</b>											
11575.05	Vert	1.0	170	55.22	74.0	-18.8	50.72	45.60	54.0	-8.40	Pass
<b>High carrier frequency</b>											
11692.00	Vert	1.0	170	55.28	74.0	-18.7	51.89	46.77	54.0	-7.23	Pass

\*- EUT front panel refers to 0 degrees position of turntable.  
 \*\*- Margin = Measured field strength - specification limit.  
 \*\*\*- Margin = Calculated field strength - specification limit,  
 where Calculated field strength = Measured field strength + average factor.

**Table 7.4.10 Average factor calculation**

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
2.788	5.029	NA	NA	NA	-5.12

\*- Average factor was calculated as follows  
 for pulse train shorter than 100 ms:  $Average\ factor = 20 \times \log_{10} \left( \frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{Train\ duration} \times Number\ of\ bursts\ within\ pulse\ train \right)$   
 for pulse train longer than 100 ms:  $Average\ factor = 20 \times \log_{10} \left( \frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{100\ ms} \times Number\ of\ bursts\ within\ 100\ ms \right)$



<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions			
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 10/24/2012 - 10/25/2012			
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa	<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 16 dBi dual slant antenna			

Table 7.4.11 Field strength of spurious emissions below 1 GHz within restricted bands

ASSIGNED FREQUENCY BAND: 5725 - 5850 MHz  
 INVESTIGATED FREQUENCY RANGE: 0.009 – 1000 MHz  
 TEST DISTANCE: 3 m  
 MODULATION: 64QAM  
 MODULATING SIGNAL: PRBS  
 BIT RATE: 23.04Mbps  
 DUTY CYCLE: 60 %  
 EMISSION BANDWIDTH: 5MHz  
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum  
 TRANSMITTER OUTPUT POWER: 25.77dBm at low carrier frequency  
 26.02dBm at mid carrier frequency  
 25.09dBm at high carrier frequency  
 RESOLUTION BANDWIDTH: 1.0 kHz (9 kHz – 150 kHz)  
 9.0 kHz (150 kHz – 30 MHz)  
 120 kHz (30 MHz – 1000 MHz)  
 VIDEO BANDWIDTH: > Resolution bandwidth  
 TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)  
 Biconilog (30 MHz – 1000 MHz)

Frequency, MHz	Peak emission, dB(µV/m)	Quasi-peak			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(µV/m)	Limit, dB(µV/m)	Margin, dB*				
<b>Low carrier frequency</b>								
37.53	25.2	21.0	40.0	-19.0	Vert	1.0	98	Pass
275.008	28.3	25.2	46.0	-20.8	Vert	1.0	164	
<b>Mid carrier frequency</b>								
37.53	25.2	21.0	40.0	-19.0	Vert	1.0	98	Pass
275.008	30.8	27.9	46.0	-18.1	Vert	1.0	174	
<b>High carrier frequency</b>								
37.46	27.1	23.2	40.0	-16.8	Vert	1.0	92	Pass
275.004	29.5	27.3	46.0	-18.7	Vert	1.0	178	

\*- Margin = Measured emission - specification limit.  
 \*\*- EUT front panel refer to 0 degrees position of turntable.

Reference numbers of test equipment used

HL 0446	HL 0521	HL 0604	HL 0768	HL 0769	HL 1984	HL 2909	HL 3533
HL 3535	HL 3818	HL 3901	HL 4114	HL 4276	HL 4352	HL 4353	

Full description is given in Appendix A.



HERMON LABORATORIES

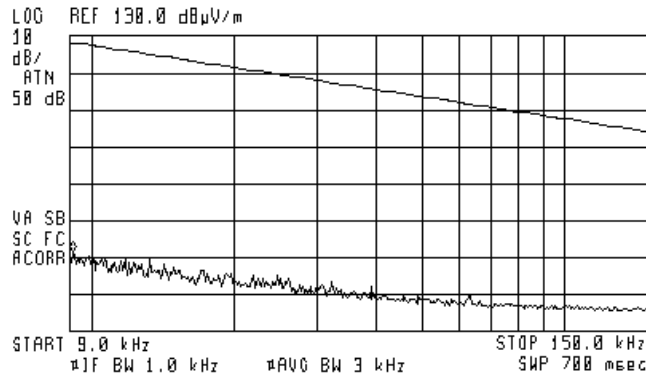
<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions			
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 10/24/2012 - 10/25/2012			
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa	<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 16 dBi dual slant antenna			

Plot 7.4.32 Radiated emission measurements from 9 to 150 kHz at the low carrier frequency

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical



ACTV DET: PEAK  
MERS DET: PEAK OP AVG  
MKR 9.2 kHz  
71.42 dBµV/m

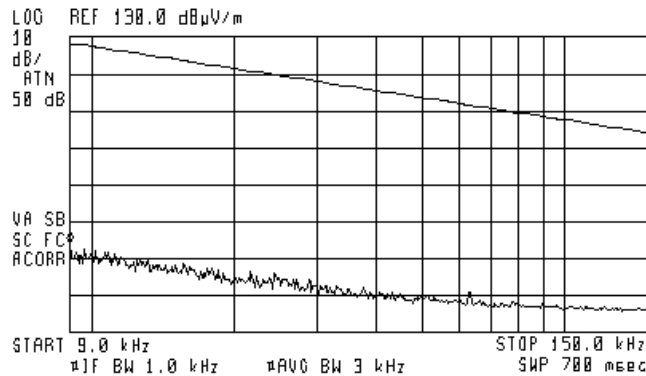


Plot 7.4.33 Radiated emission measurements from 9 to 150 kHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical



ACTV DET: PEAK  
MERS DET: PEAK OP AVG  
MKR 9.0 kHz  
74.41 dBµV/m







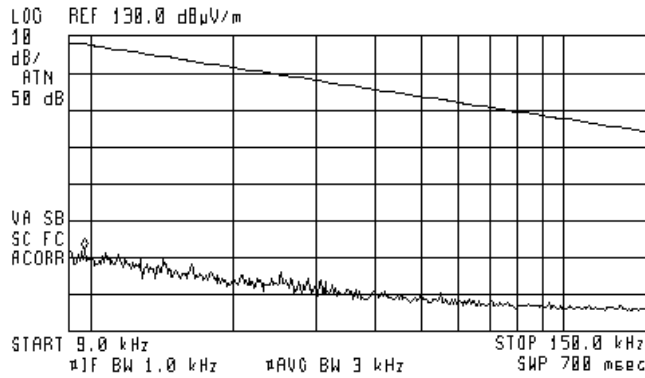
<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions			
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 10/24/2012 - 10/25/2012			
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa	<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 16 dBi dual slant antenna			

Plot 7.4.34 Radiated emission measurements from 9 to 150 kHz at the high carrier frequency

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical



ACTV DET: PEAK  
MERS DET: PEAK OP AVG  
MKR 9.8 kHz  
72.16 dBµV/m

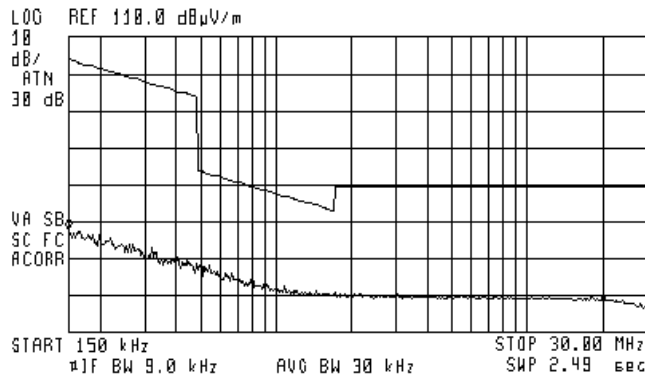


Plot 7.4.35 Radiated emission measurements from 0.15 to 30 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical



ACTV DET: PEAK  
MERS DET: PEAK OP AVG  
MKR 150 kHz  
57.82 dBµV/m





HERMON LABORATORIES

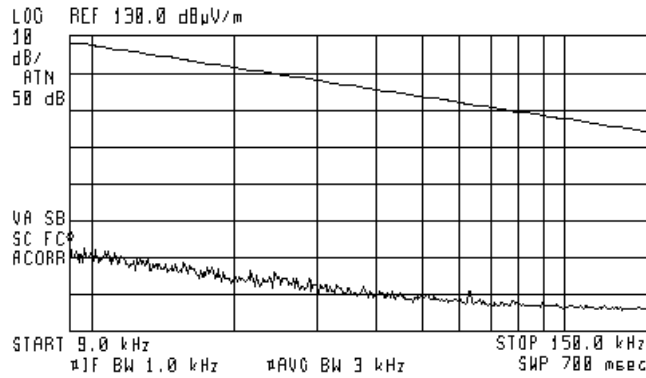
<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions			
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 10/24/2012 - 10/25/2012			
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa	<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 16 dBi dual slant antenna			

Plot 7.4.36 Radiated emission measurements from 0.15 to 30 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical



ACTV DET: PEAK  
MERS DET: PEAK OP AVG  
MKR 9.0 kHz  
74.41 dBµV/m

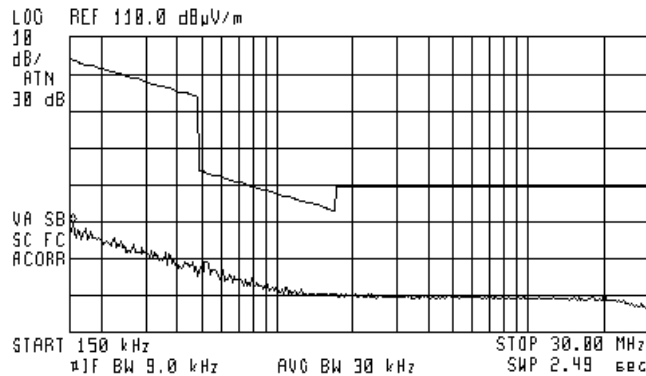


Plot 7.4.37 Radiated emission measurements from 0.15 to 30 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical



ACTV DET: PEAK  
MERS DET: PEAK OP AVG  
MKR 150 kHz  
59.34 dBµV/m



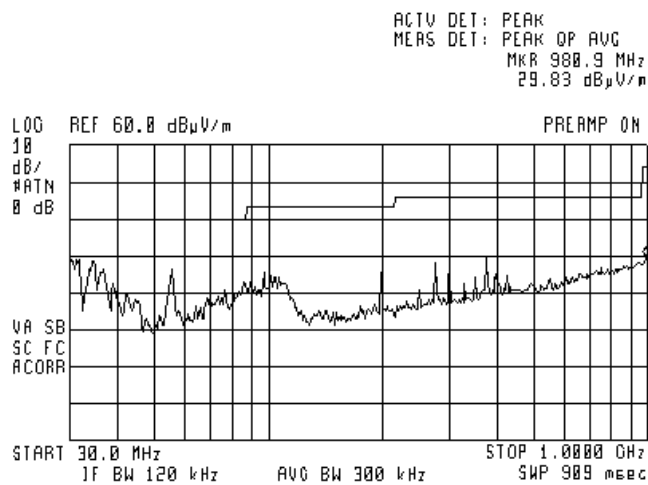


HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa
<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 16 dBi dual slant antenna	

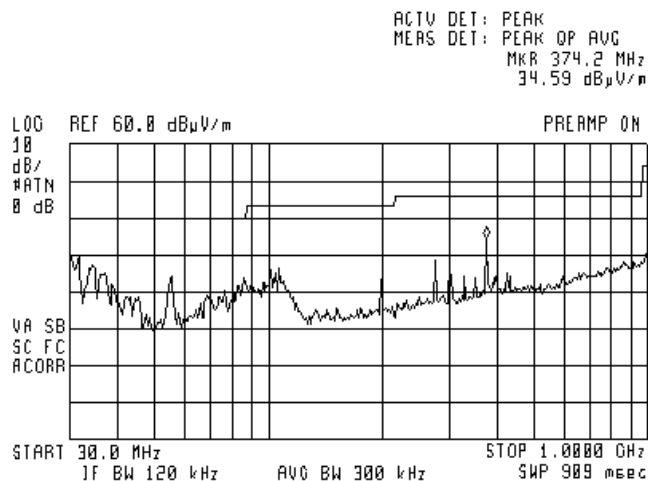
Plot 7.4.38 Radiated emission measurements from 30 to 1000 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.4.39 Radiated emission measurements from 30 to 1000 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical and Horizontal





HERMON LABORATORIES

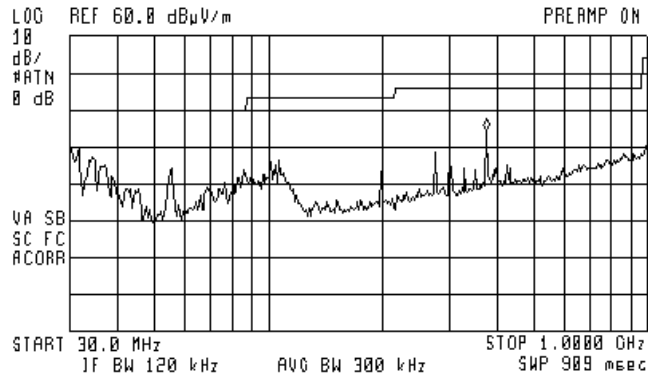
<b>Test specification:</b>		<b>FCC section 15.247(d), Radiated spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b>		<b>Verdict:</b>	
Compliance		PASS	
<b>Date(s):</b>		10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa	<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 16 dBi dual slant antenna			

**Plot 7.4.40 Radiated emission measurements from 30 to 1000 MHz at the high carrier frequency**

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical and Horizontal



ACTV DET: PEAK  
MEAS DET: PEAK OP AVG  
MKR 374.2 MHz  
34.59 dBµV/m





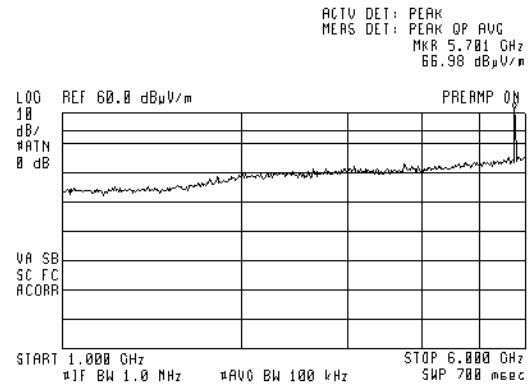
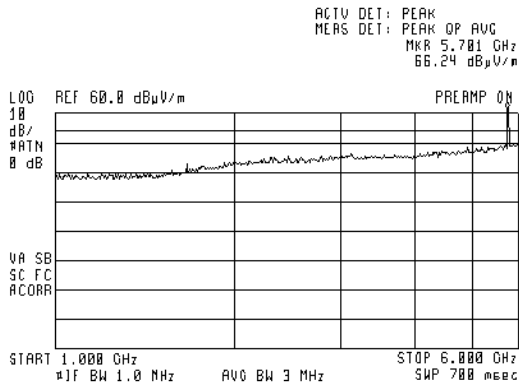
HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa
<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 16 dBi dual slant antenna	

Plot 7.4.41 Radiated emission measurements from 1000 to 6000 MHz at the low carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

Semi anechoic chamber  
3 m  
Vertical and Horizontal  
DETECTOR: Average



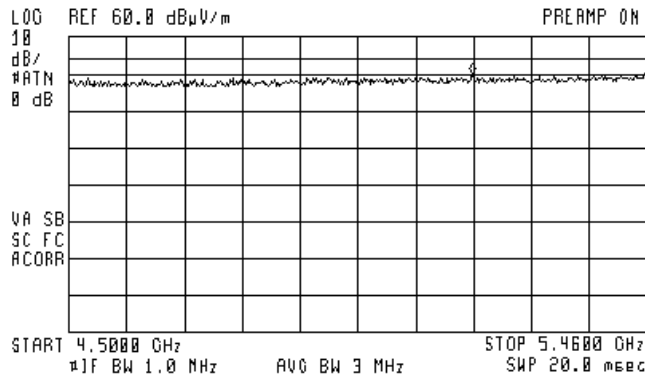
Plot 7.4.42 Radiated emission measurements from 4550 to 5460 MHz at the low carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:

Semi anechoic chamber  
3 m  
Vertical and Horizontal



ACTV DET: PEAK  
MEAS DET: PEAK OP AVG  
MKR 5.1696 GHz  
58.29 dBµV/m





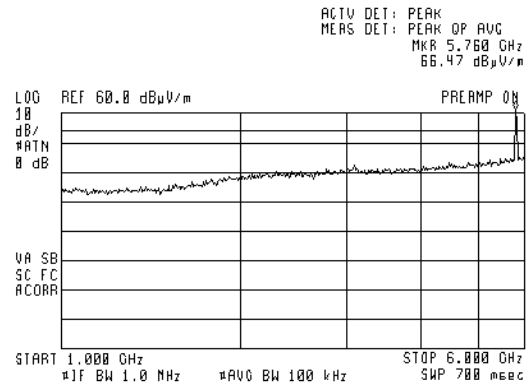
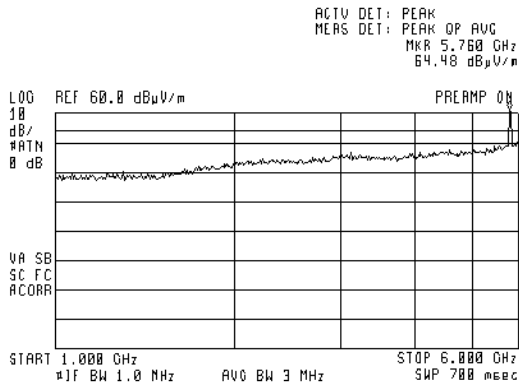
HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa
<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 16 dBi dual slant antenna	

Plot 7.4.43 Radiated emission measurements from 1000 to 6000 MHz at the mid carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

Semi anechoic chamber  
3 m  
Vertical and Horizontal  
DETECTOR: Average



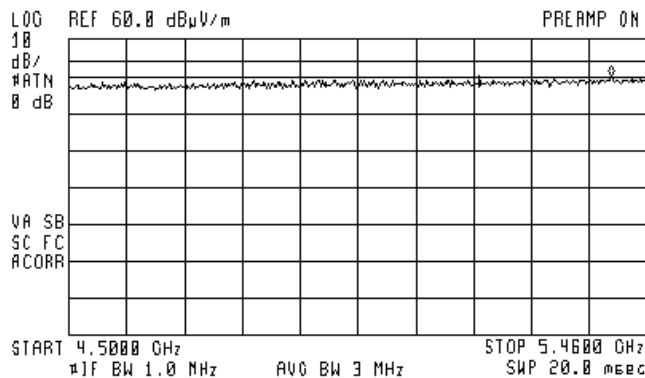
Plot 7.4.44 Radiated emission measurements from 4550 to 5460 MHz at the mid carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:

Semi anechoic chamber  
3 m  
Vertical and Horizontal



ACTV DET: PEAK  
MERS DET: PEAK OP AVG  
MKR 5.4000 GHz  
50.21 dBμV/m





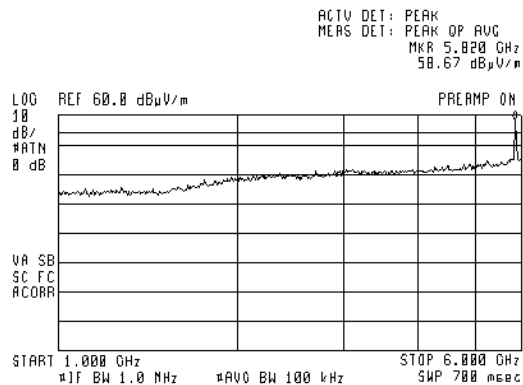
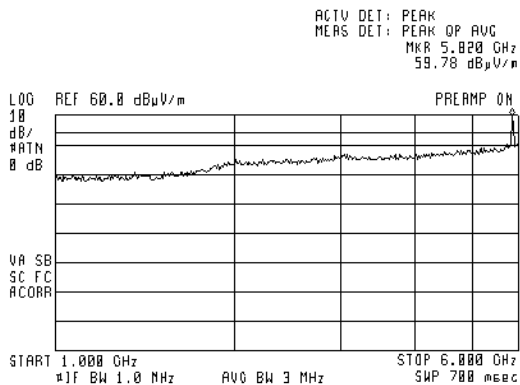
HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions			
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 10/24/2012 - 10/25/2012			
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa	<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 16 dBi dual slant antenna			

**Plot 7.4.45 Radiated emission measurements from 1000 to 6000 MHz at the high carrier frequency**

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

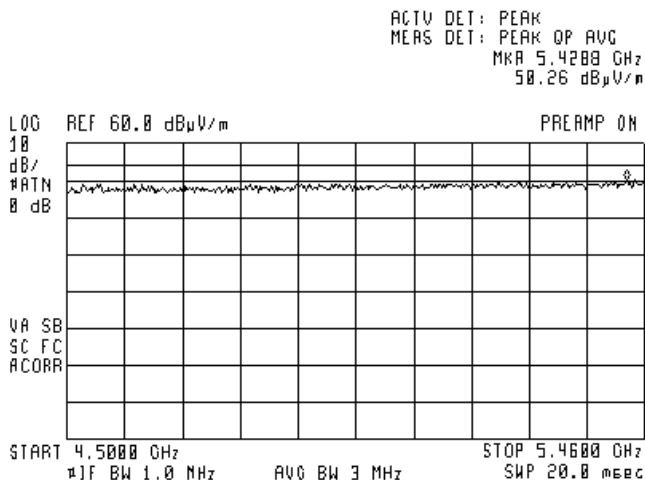
Semi anechoic chamber  
3 m  
Vertical and Horizontal  
DETECTOR: Average



**Plot 7.4.46 Radiated emission measurements from 4550 to 5460 MHz at the high carrier frequency**

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:

Semi anechoic chamber  
3 m  
Vertical and Horizontal





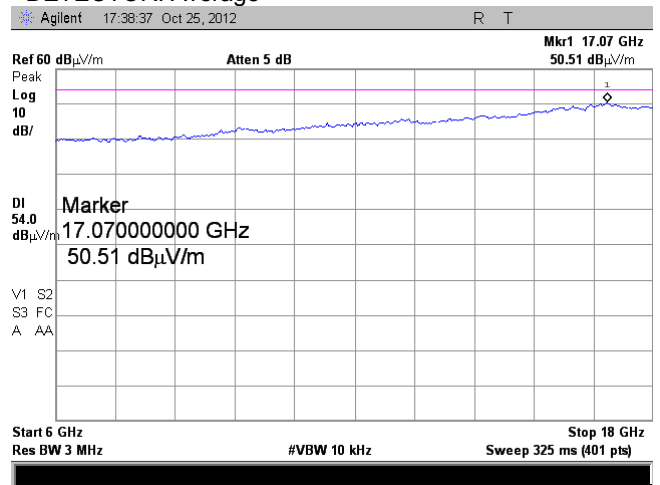
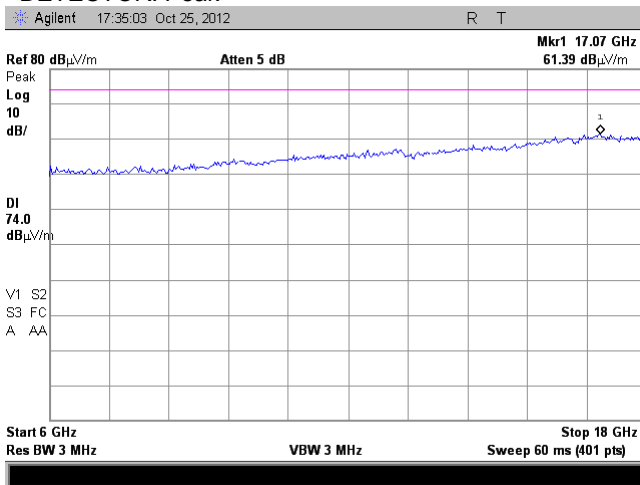
HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa
<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 16 dBi dual slant antenna	

Plot 7.4.47 Radiated emission measurements from 6000 to 18000 MHz at the low carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

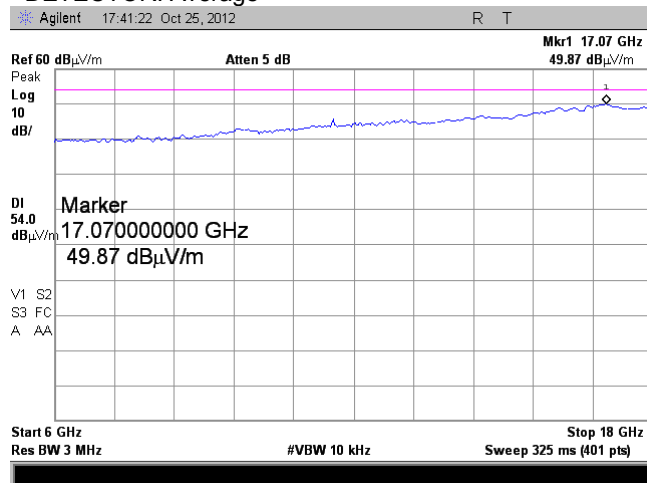
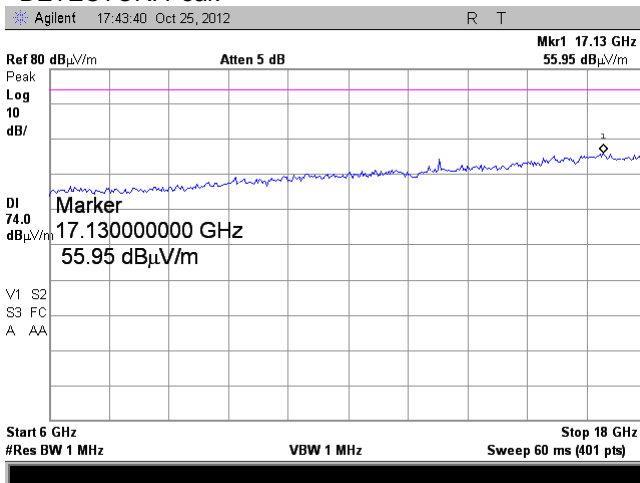
Semi anechoic chamber  
3 m  
Vertical and Horizontal  
DETECTOR: Average



Plot 7.4.48 Radiated emission measurements from 6000 to 18000 MHz at the mid carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

Semi anechoic chamber  
3 m  
Vertical and Horizontal  
DETECTOR: Average







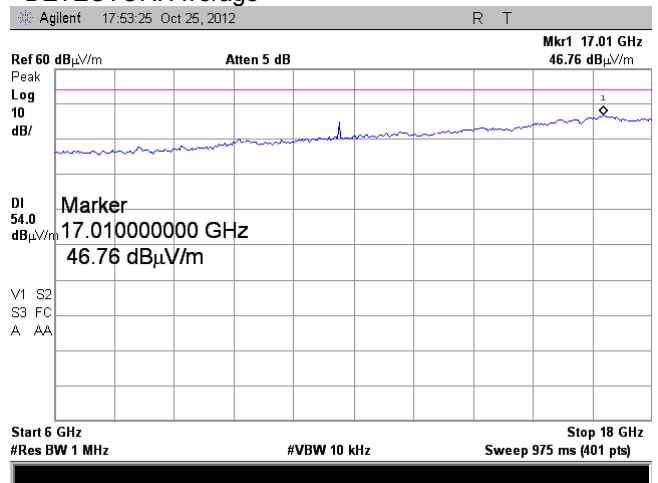
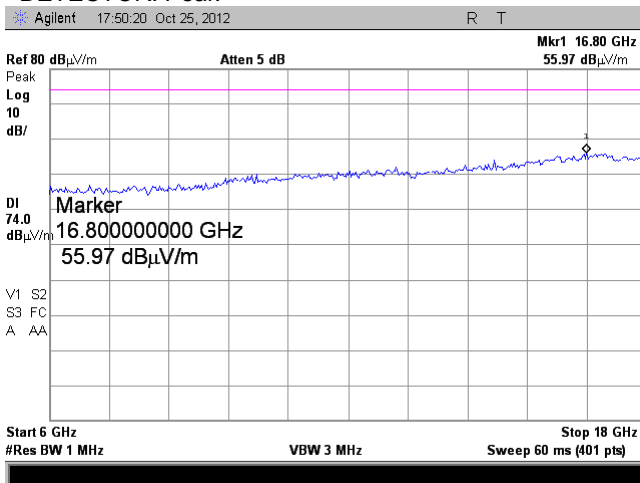
HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa
<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 16 dBi dual slant antenna	

Plot 7.4.49 Radiated emission measurements from 6000 to 18000 MHz at the high carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

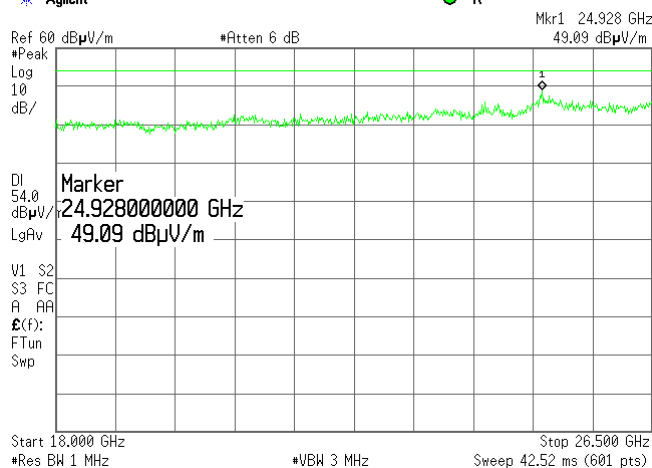
Semi anechoic chamber  
3 m  
Vertical and Horizontal  
DETECTOR: Average



Plot 7.4.50 Radiated emission measurements from 18000 to 26500 MHz at the low carrier frequency

TEST SITE: OATS  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical and Horizontal

Agilent R



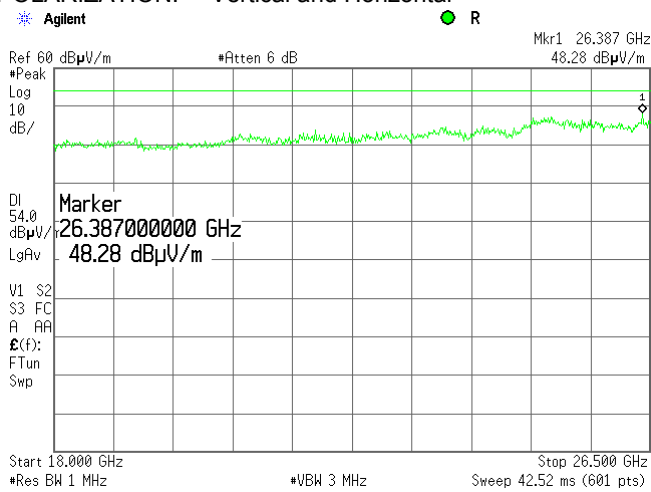


HERMON LABORATORIES

<b>Test specification:</b>		<b>FCC section 15.247(d), Radiated spurious emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b>		<b>Verdict:</b>	
Compliance		PASS	
<b>Date(s):</b>		10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa	<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 16 dBi dual slant antenna			

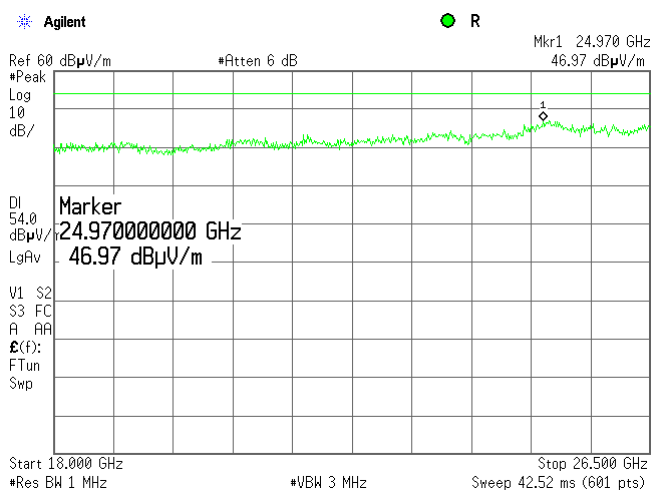
Plot 7.4.51 Radiated emission measurements from 18000 to 26500 MHz at the mid carrier frequency

TEST SITE: OATS  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.4.52 Radiated emission measurements from 18000 to 26500 MHz at the high carrier frequency

TEST SITE: OATS  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical and Horizontal





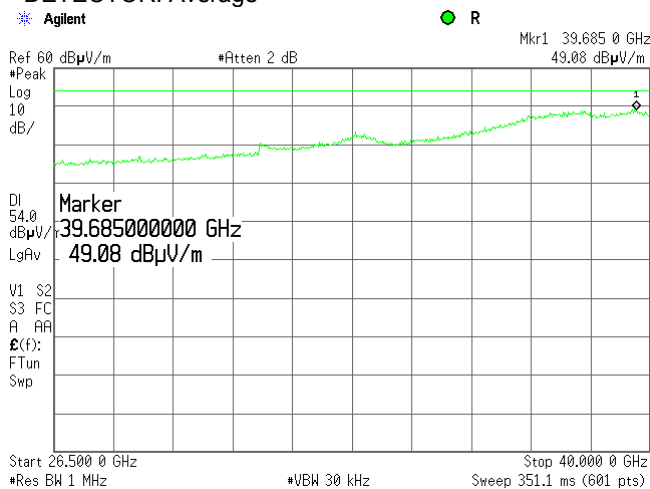
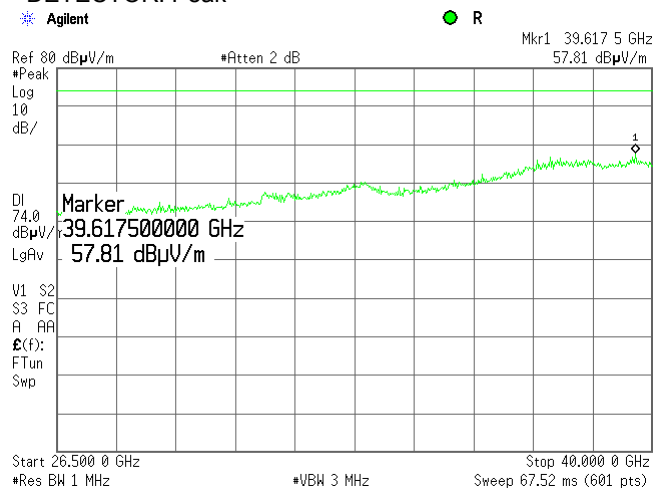
HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa
<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 16 dBi dual slant antenna	

Plot 7.4.53 Radiated emission measurements from 26500 to 40000 MHz at the low carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

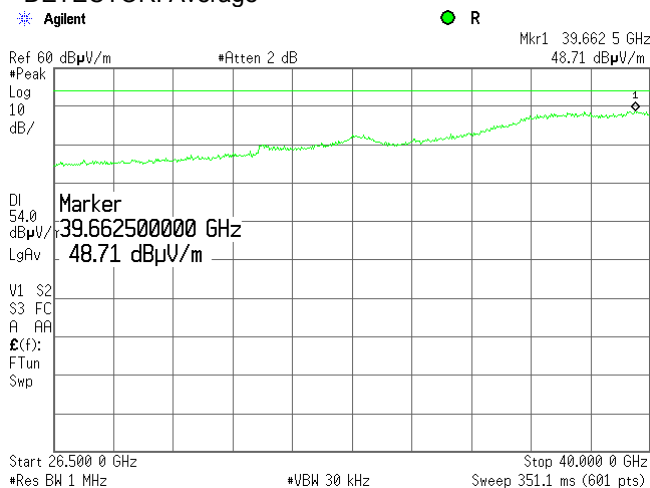
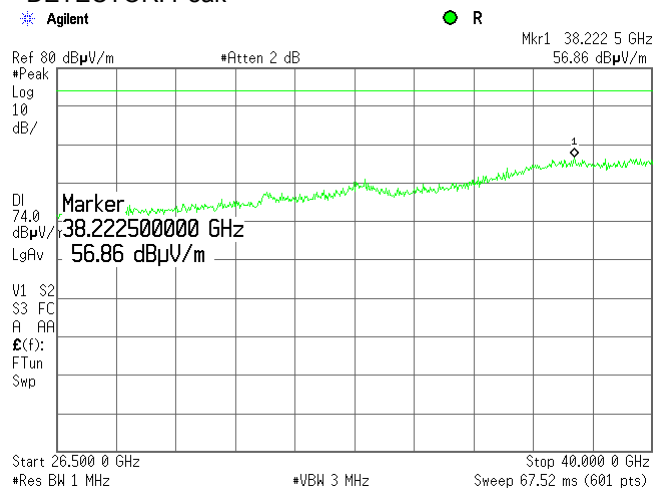
OATS  
3 m  
Vertical and Horizontal  
DETECTOR: Average



Plot 7.4.54 Radiated emission measurements from 26500 to 40000 MHz at the mid carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

OATS  
3 m  
Vertical and Horizontal  
DETECTOR: Average





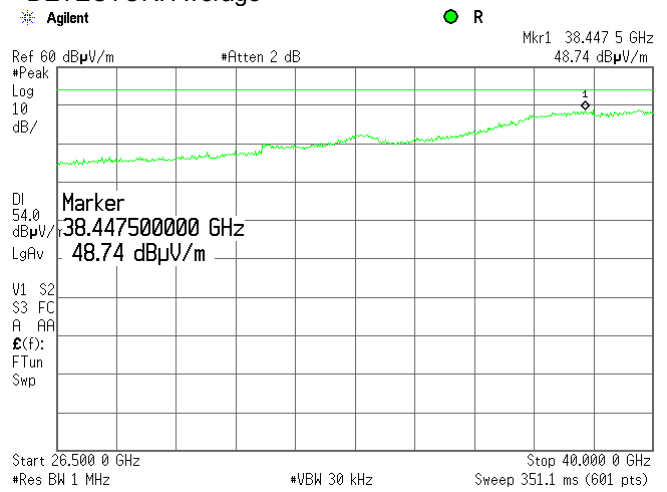
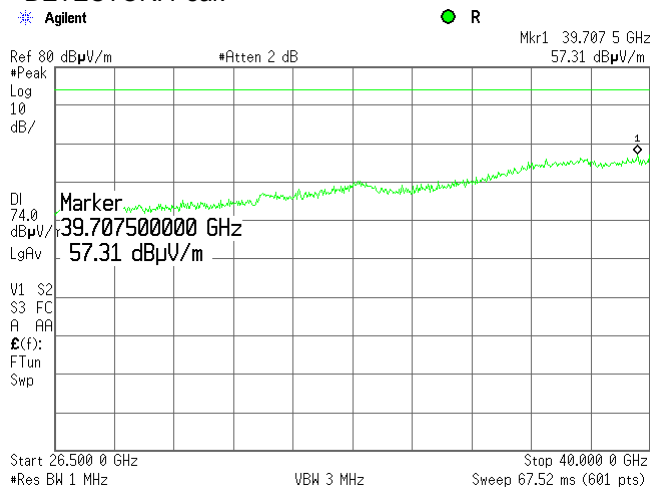
HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa
<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 16 dBi dual slant antenna	

**Plot 7.4.55 Radiated emission measurements from 26500 to 40000 MHz at the high carrier frequency**

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

OATS  
3 m  
Vertical and Horizontal  
DETECTOR: Average





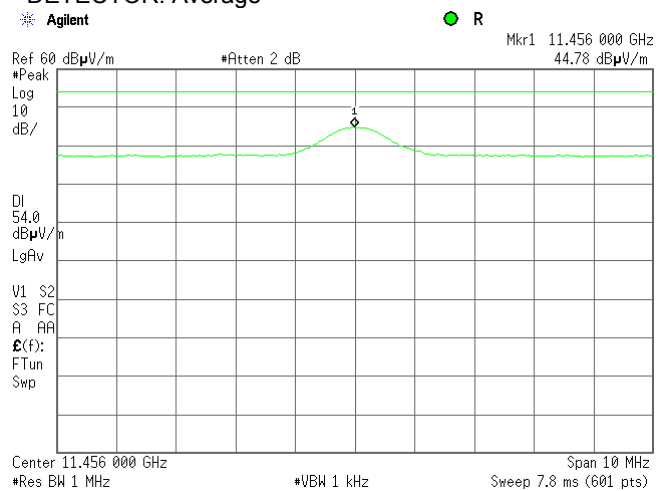
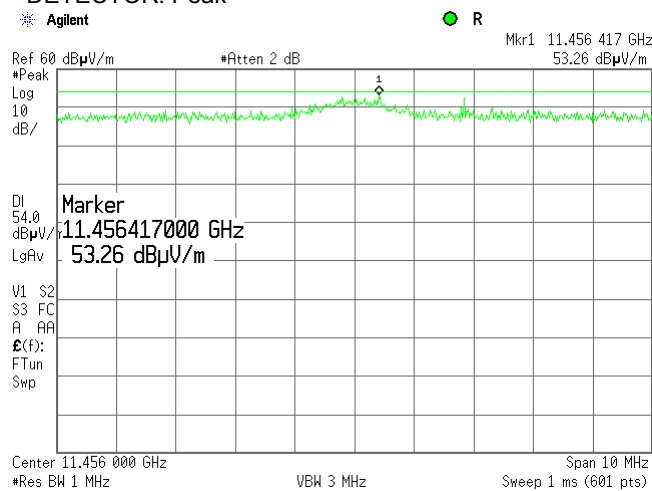
HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa
<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 16 dBi dual slant antenna	

Plot 7.4.56 Radiated emission measurements at the second harmonic of low carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

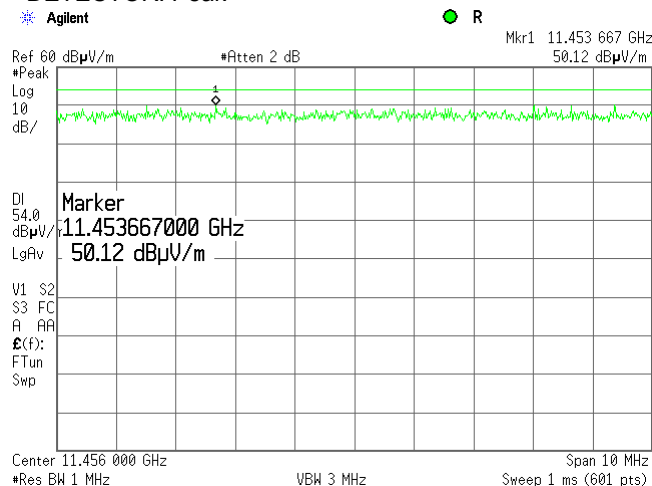
OATS  
3 m  
Vertical  
DETECTOR: Average



Plot 7.4.57 Radiated emission measurements at the second harmonic of low carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

OATS  
3 m  
Horizontal  
DETECTOR: Average



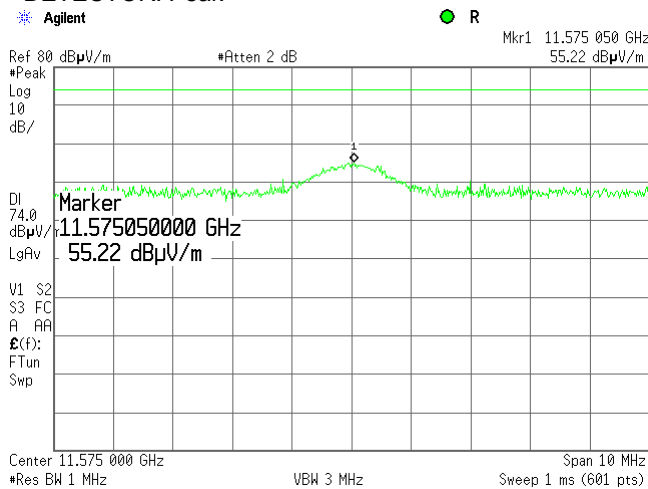


HERMON LABORATORIES

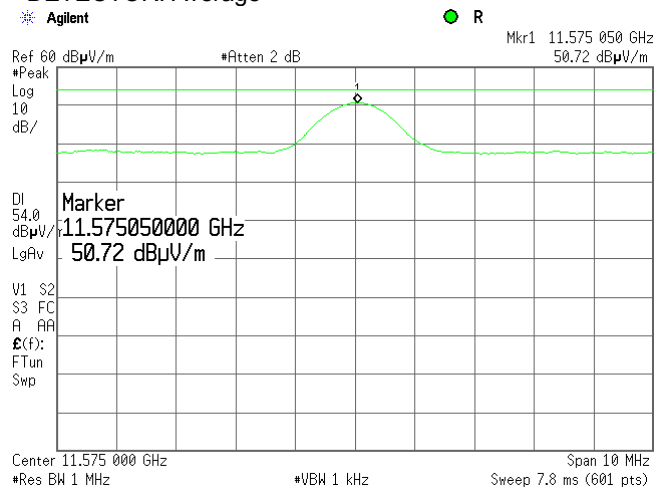
<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions	
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 10/24/2012 - 10/25/2012	
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa
<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 16 dBi dual slant antenna	

Plot 7.4.58 Radiated emission measurements at the second harmonic of mid carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

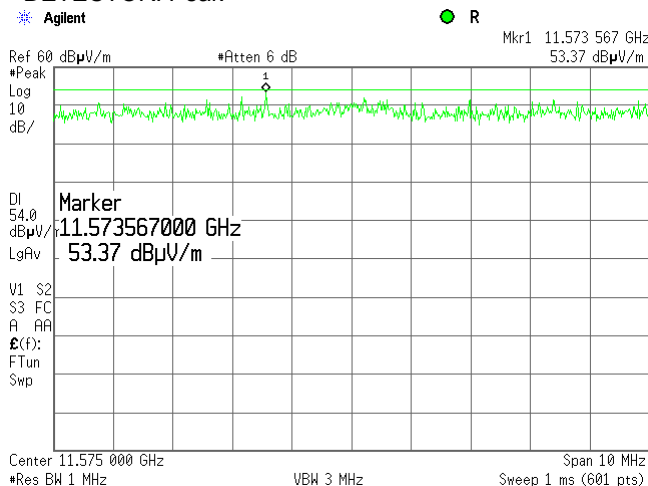


OATS  
3 m  
Vertical  
DETECTOR: Average



Plot 7.4.59 Radiated emission measurements at the second harmonic of mid carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak



OATS  
3 m  
Horizontal  
DETECTOR: Average



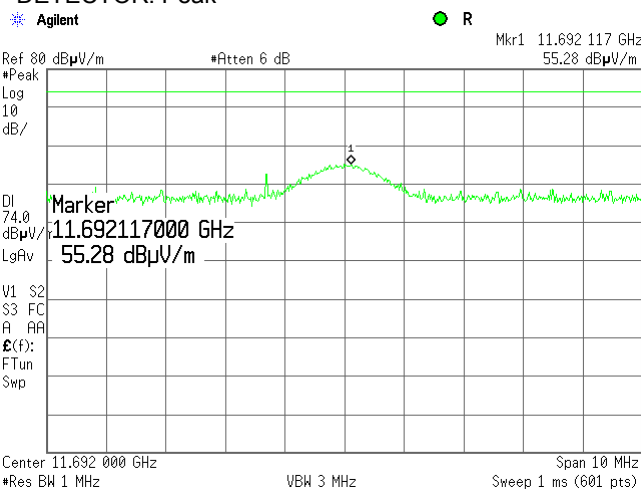


HERMON LABORATORIES

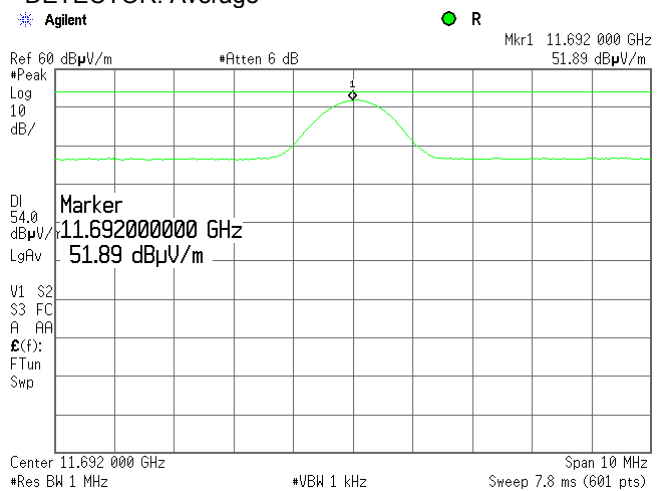
<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions			
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 10/24/2012 - 10/25/2012			
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa	<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 16 dBi dual slant antenna			

Plot 7.4.60 Radiated emission measurements at the second harmonic of high carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak

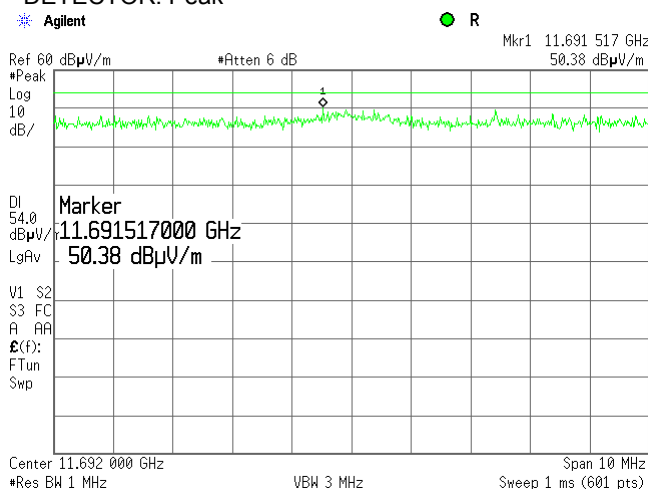


OATS  
3 m  
Vertical  
DETECTOR: Average

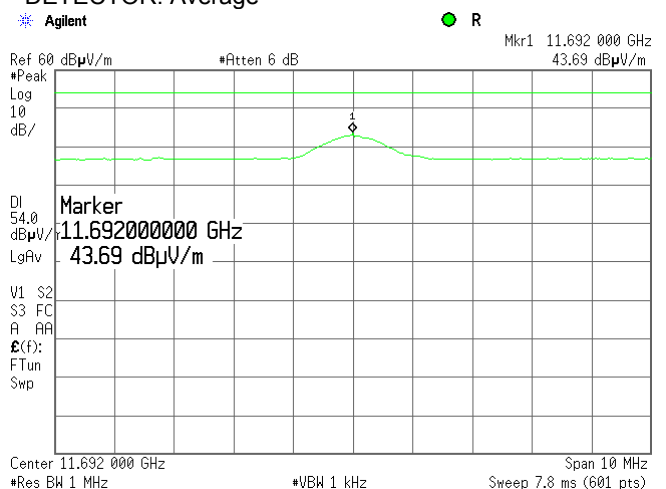


Plot 7.4.61 Radiated emission measurements at the second harmonic of high carrier frequency

TEST SITE:  
TEST DISTANCE:  
ANTENNA POLARIZATION:  
DETECTOR: Peak



OATS  
3 m  
Horizontal  
DETECTOR: Average

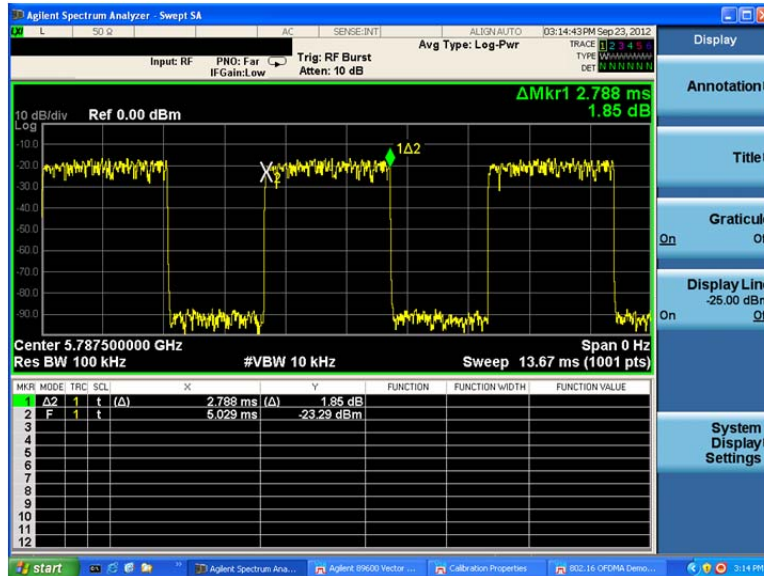




HERMON LABORATORIES

<b>Test specification:</b> FCC section 15.247(d), Radiated spurious emissions			
<b>Test procedure:</b> 558074 D01 DTS Meas Guidance v01/ANSI C63.4, Section 13.1.4			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 10/24/2012 - 10/25/2012			
<b>Temperature:</b> 24.1 °C	<b>Air Pressure:</b> 1015 hPa	<b>Relative Humidity:</b> 46 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b> EUT with 16 dBi dual slant antenna			

Plot 7.4.62 Transmission pulse duration







<b>Test specification:</b>		<b>FCC section 15.247(d), Band edge emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/12/2012	
<b>Temperature:</b> 24 °C		<b>Air Pressure:</b> 1006 hPa	
		<b>Relative Humidity:</b> 48 %	
		<b>Power Supply:</b> 48 VDC	
<b>Remarks:</b>			
		<b>Verdict:</b> PASS	

## 7.5 Band edge emissions at RF antenna connector

### 7.5.1 General

This test was performed to measure band edge emissions at RF antenna connector. Specification test limits are given in Table 7.5.1.

Table 7.5.1 Band edge emission limits

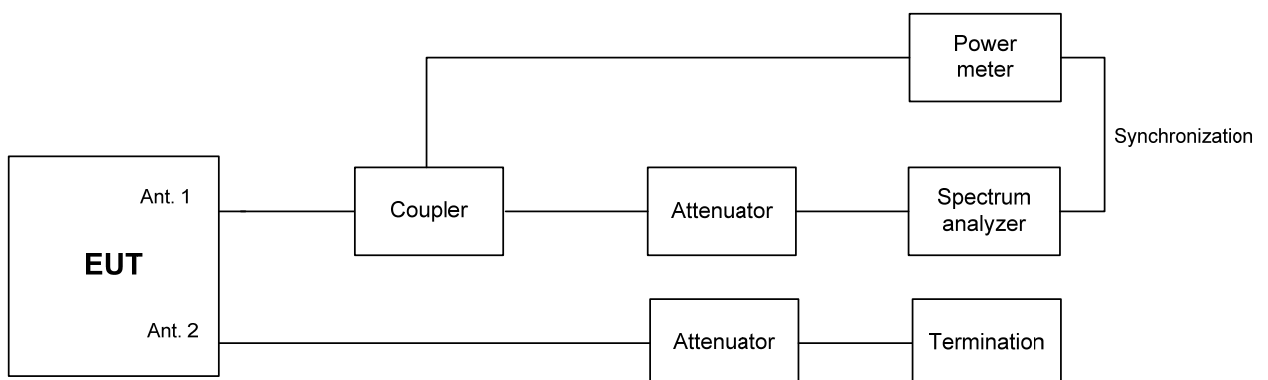
Output power	Assigned frequency, MHz	Attenuation below carrier*, dBc
Peak	902.0 – 928.0	20.0
	2400.0 – 2483.5	
	5725.0 – 5850.0	
Averaged over a time interval	902.0 – 928.0	30.0
	2400.0 – 2483.5	
	5725.0 – 5850.0	

\* - Band edge emission limit is provided in terms of attenuation below the peak of modulated carrier measured with the same resolution bandwidth.

### 7.5.2 Test procedure

- 7.5.2.1 The EUT was set up as shown in Figure 7.5.1, energized normally modulated at the maximum data rate and its proper operation was checked.
- 7.5.2.2 The EUT was adjusted to produce maximum available to end user RF output power at the lowest carrier frequency.
- 7.5.2.3 The spectrum analyzer span was set to capture the carrier frequency and associated modulation products. The resolution bandwidth was set wider than 1 % of the frequency span.
- 7.5.2.4 The spectrum analyzer was set in max hold mode and allowed trace to stabilize. The highest emission level within the authorized band was measured.
- 7.5.2.5 The maximum band edge emission and modulation product outside of the band were measured as provided in Table 7.5.2 and associated plots and referenced to the highest emission level measured within the authorized band.
- 7.5.2.6 The above procedure was repeated with the EUT adjusted to produce maximum RF output power at the highest carrier frequency.

Figure 7.5.1 Band edge emission test setup





<b>Test specification:</b>		<b>FCC section 15.247(d), Band edge emissions</b>			
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01			
<b>Test mode:</b>		Compliance		<b>Verdict:</b> <b>PASS</b>	
<b>Date(s):</b>		9/12/2012			
<b>Temperature:</b> 24 °C		<b>Air Pressure:</b> 1006 hPa		<b>Relative Humidity:</b> 48 %	
<b>Remarks:</b>		<b>Power Supply:</b> 48 VDC			

**Table 7.5.2 Band edge emission test results**

ASSIGNED FREQUENCY RANGE: 5725-5850 MHz  
 DETECTOR USED: Average  
 MODULATING SIGNAL: PRBS  
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum  
 RESOLUTION BANDWIDTH: 100 kHz  
 VIDEO BANDWIDTH: ≥ RBW

**ANTENNA 1**

CANNEL BANDWIDTH 5 MHz

Frequency, MHz	Band edge emission at antenna 1 dBm	Emission at carrier, dBm	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
QPSK						
5728	-16.56	13.700	30.260	30	0.260	Pass
5846	-17.01	14.881	31.891		1.891	
64 QAM						
5728	-17.37	15.510	32.880	30	2.880	Pass
5846	-16.66	13.969	30.629		0.629	

CANNEL BANDWIDTH 10 MHz

Frequency, MHz	Band edge emission, dBm	Emission at carrier, dBm	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
QPSK						
5730.5	-21.10	11.482	32.582	30	2.582	Pass
5844.0	-20.07	10.340	30.410		0.410	
64 QAM						
5730.5	-20.73	11.614	32.344	30.0	2.344	Pass
5844.0	-20.32	10.653	30.973		0.973	

**ANTENNA 2**

CANNEL BANDWIDTH 5 MHz

Frequency, MHz	Band edge emission at antenna 1 dBm	Emission at carrier, dBm	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
QPSK						
5728	-15.67	15.185	30.855	30	0.855	Pass
5846	-18.56	11.464	30.024		0.024	
64 QAM						
5728	-16.24	14.243	30.483	30	0.483	Pass
5846	-18.59	11.460	30.050		0.050	

CANNEL BANDWIDTH 10 MHz

Frequency, MHz	Band edge emission, dBm	Emission at carrier, dBm	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
QPSK						
5730.5	-18.55	11.796	30.346	30	0.346	Pass
5844.0	-20.62	10.413	31.033		1.033	
64 QAM						
5730.5	-20.41	11.567	31.977	30.0	1.977	Pass
5844.0	-19.64	10.642	30.282		0.282	

\*- Margin, dB = Attenuation below carrier – specification limit.

**Reference numbers of test equipment used**

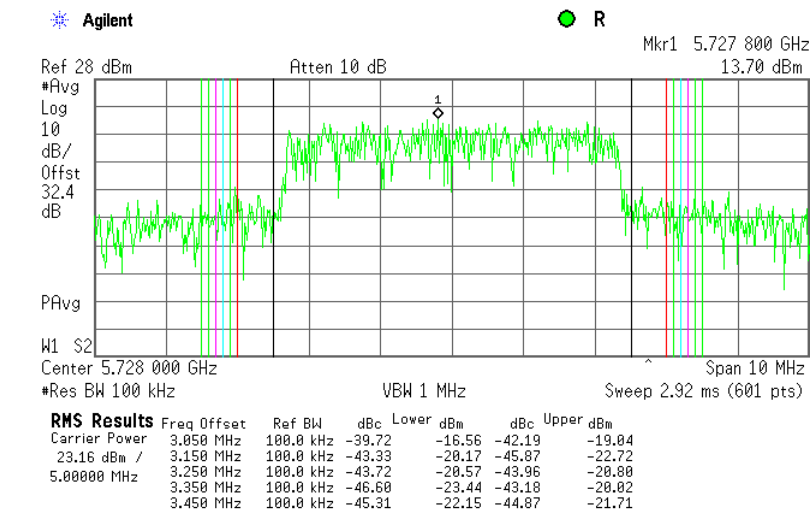
HL 3301	HL 3302	HL 3442	HL 3781	HL 3818	HL 3868		
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Full description is given in Appendix A.

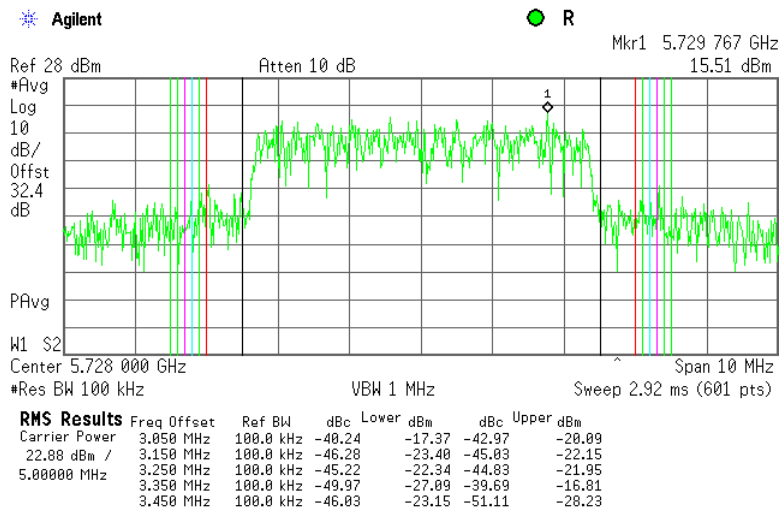


<b>Test specification:</b>		<b>FCC section 15.247(d), Band edge emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/12/2012	
<b>Temperature: 24 °C</b>		<b>Air Pressure: 1006 hPa</b>	
<b>Relative Humidity: 48 %</b>		<b>Power Supply: 48 VDC</b>	
<b>Remarks:</b>			
		<b>Verdict: PASS</b>	

Plot 7.5.1 The highest band edge emission at low carrier frequency, 5 MHz BW, QPSK modulation, Antenna 1



Plot 7.5.2 The highest band edge emission at low carrier frequency, 5 MHz BW, 64QAM modulation, Antenna 1

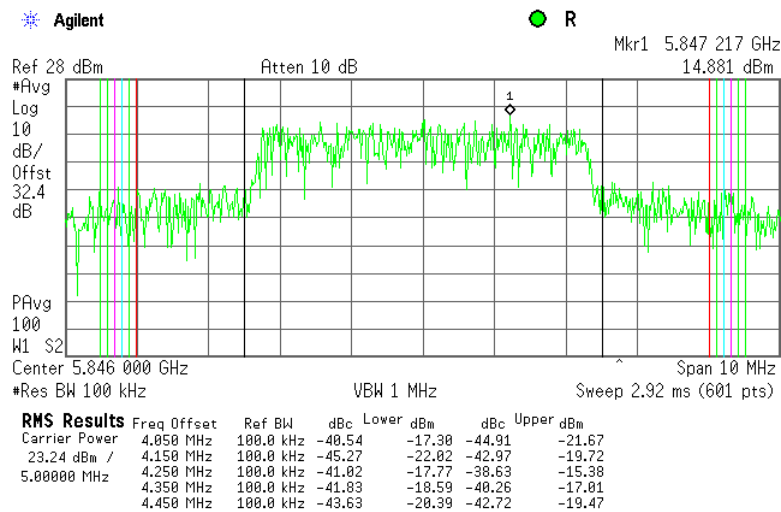




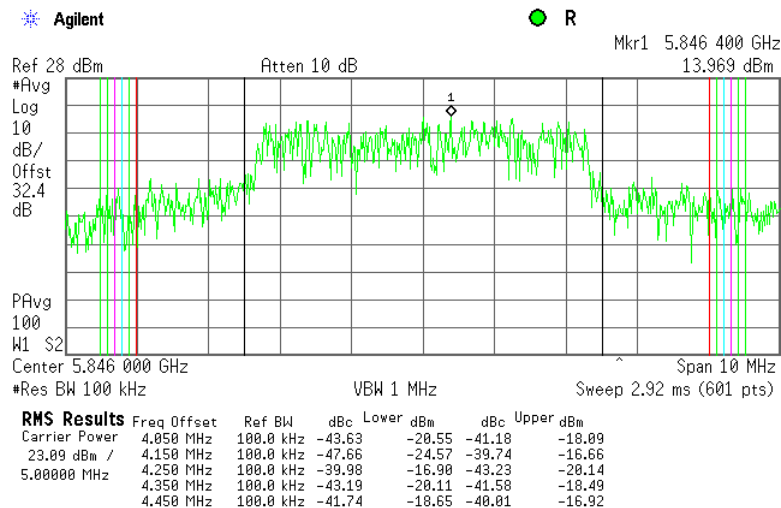
HERMON LABORATORIES

<b>Test specification:</b>		<b>FCC section 15.247(d), Band edge emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/12/2012	
<b>Temperature: 24 °C</b>		<b>Air Pressure: 1006 hPa</b>	
<b>Relative Humidity: 48 %</b>		<b>Power Supply: 48 VDC</b>	
<b>Remarks:</b>			
		<b>Verdict: PASS</b>	

Plot 7.5.3 The highest band edge emission at high carrier frequency, 5 MHz BW, QPSK modulation, Antenna 1



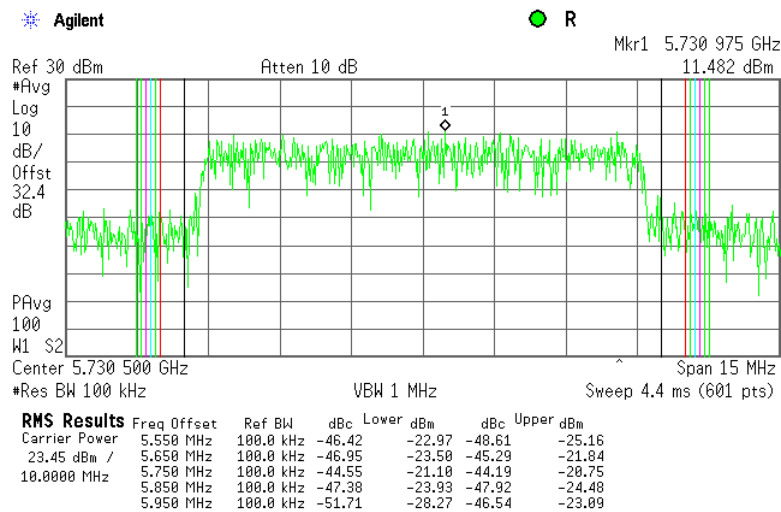
Plot 7.5.4 The highest band edge emission at high carrier frequency, 5 MHz BW, 64QAM modulation, Antenna 1



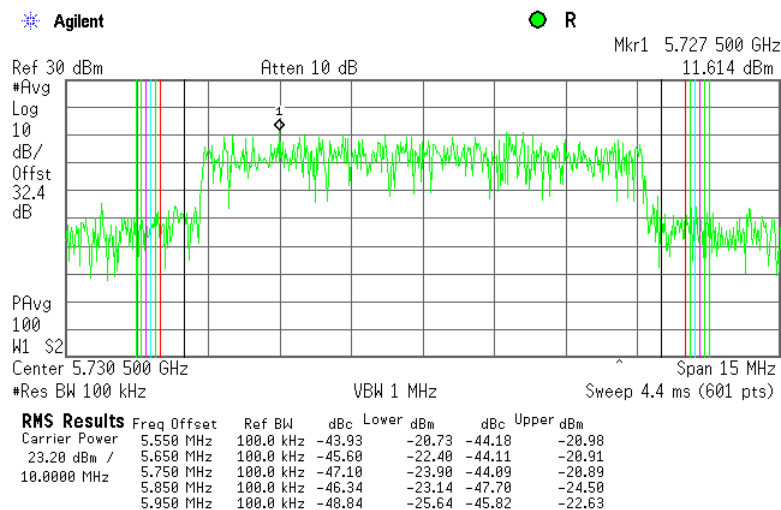


<b>Test specification:</b>		<b>FCC section 15.247(d), Band edge emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/12/2012	
<b>Temperature: 24 °C</b>		<b>Air Pressure: 1006 hPa</b>	
<b>Relative Humidity: 48 %</b>		<b>Power Supply: 48 VDC</b>	
<b>Remarks:</b>			
		<b>Verdict: PASS</b>	

Plot 7.5.5 The highest band edge emission at low carrier frequency, 10 MHz BW, QPSK modulation, Antenna 1



Plot 7.5.6 The highest band edge emission at low carrier frequency, 10 MHz BW, 64QAM modulation, Antenna 1

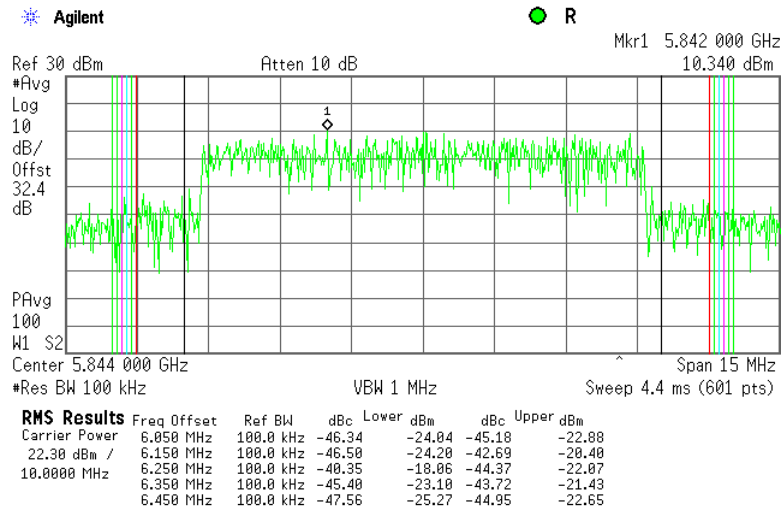




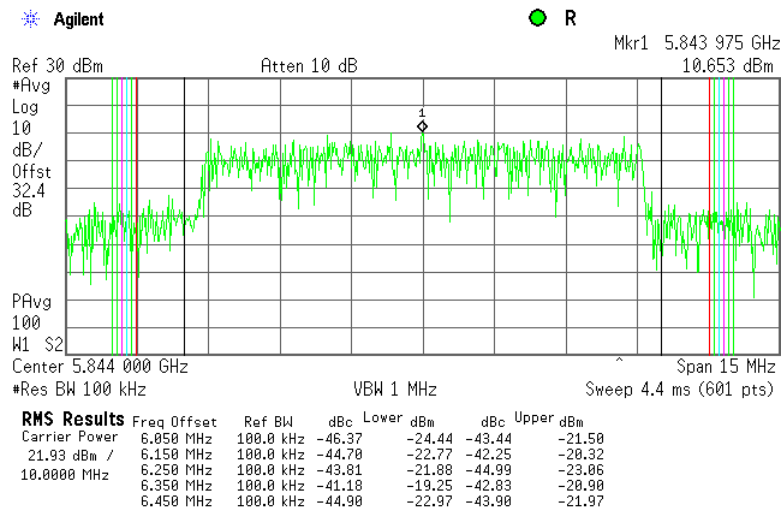
HERMON LABORATORIES

<b>Test specification:</b>		<b>FCC section 15.247(d), Band edge emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/12/2012	
<b>Temperature: 24 °C</b>		<b>Air Pressure: 1006 hPa</b>	
<b>Relative Humidity: 48 %</b>		<b>Power Supply: 48 VDC</b>	
<b>Remarks:</b>			
		<b>Verdict: PASS</b>	

Plot 7.5.7 The highest band edge emission at high carrier frequency, 5 MHz BW, QPSK modulation, Antenna 1



Plot 7.5.8 The highest band edge emission at high carrier frequency, 5 MHz BW, 64QAM modulation, Antenna 1

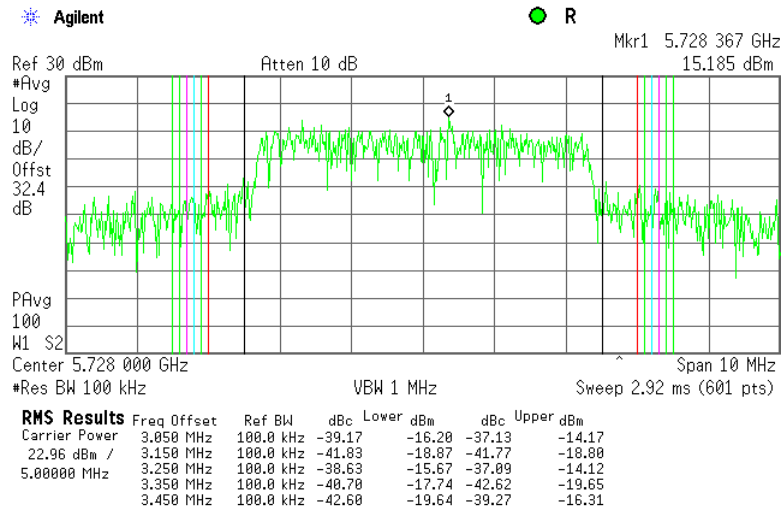




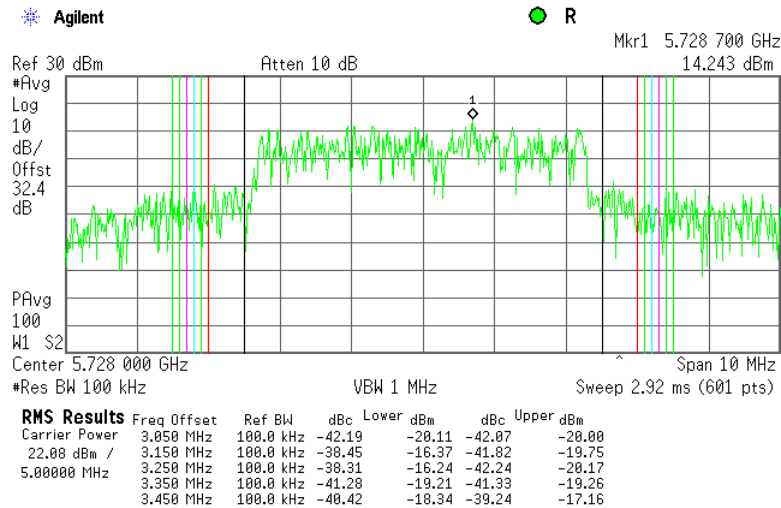
HERMON LABORATORIES

<b>Test specification:</b>		<b>FCC section 15.247(d), Band edge emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/12/2012	
<b>Temperature: 24 °C</b>		<b>Air Pressure: 1006 hPa</b>	
<b>Relative Humidity: 48 %</b>		<b>Power Supply: 48 VDC</b>	
<b>Remarks:</b>			
		<b>Verdict: PASS</b>	

Plot 7.5.9 The highest band edge emission at low carrier frequency, 5 MHz BW, QPSK modulation, Antenna 2



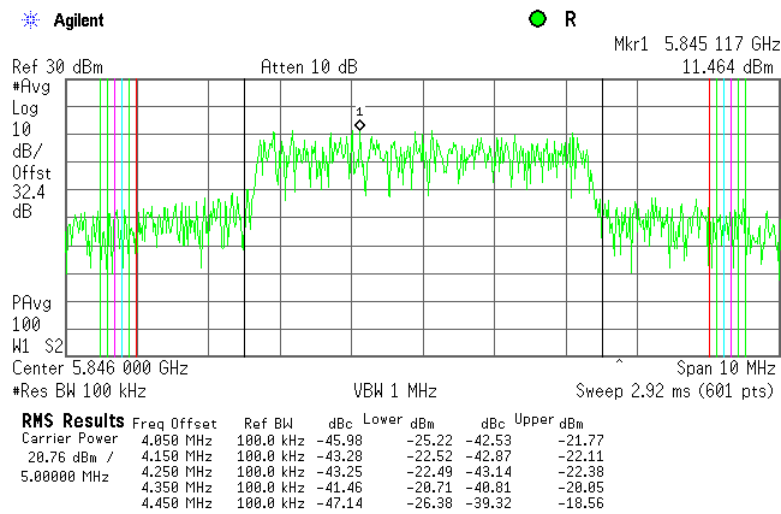
Plot 7.5.10 The highest band edge emission at low carrier frequency, 5 MHz BW, 64QAM modulation, Antenna 2



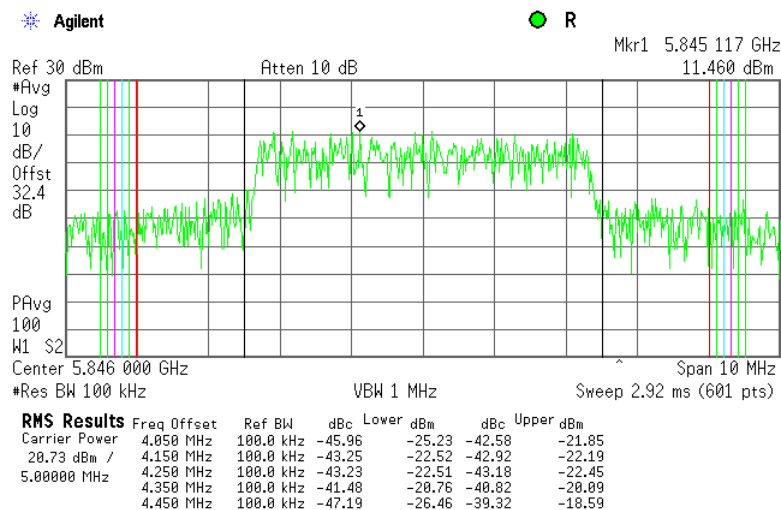


<b>Test specification:</b>		<b>FCC section 15.247(d), Band edge emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/12/2012	
<b>Temperature: 24 °C</b>		<b>Air Pressure: 1006 hPa</b>	
<b>Relative Humidity: 48 %</b>		<b>Power Supply: 48 VDC</b>	
<b>Remarks:</b>			
		<b>Verdict: PASS</b>	

Plot 7.5.11 The highest band edge emission at high carrier frequency, 5 MHz BW, QPSK modulation, Antenna 2



Plot 7.5.12 The highest band edge emission at high carrier frequency, 5 MHz BW, 64QAM modulation, Antenna 2



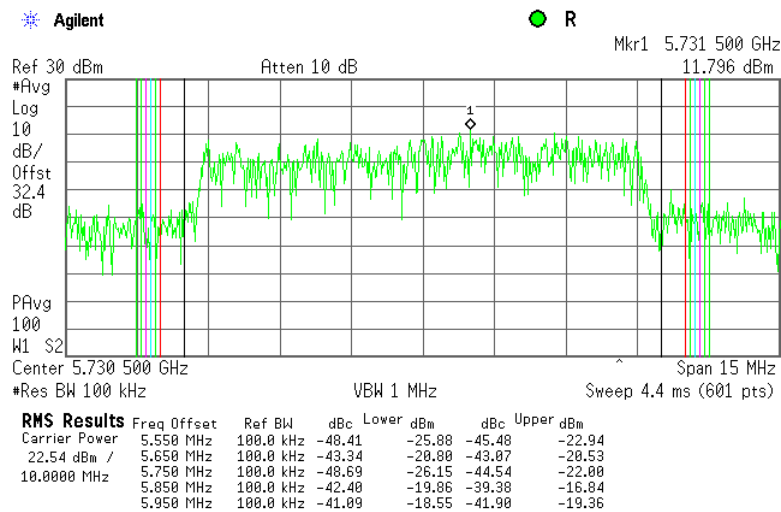




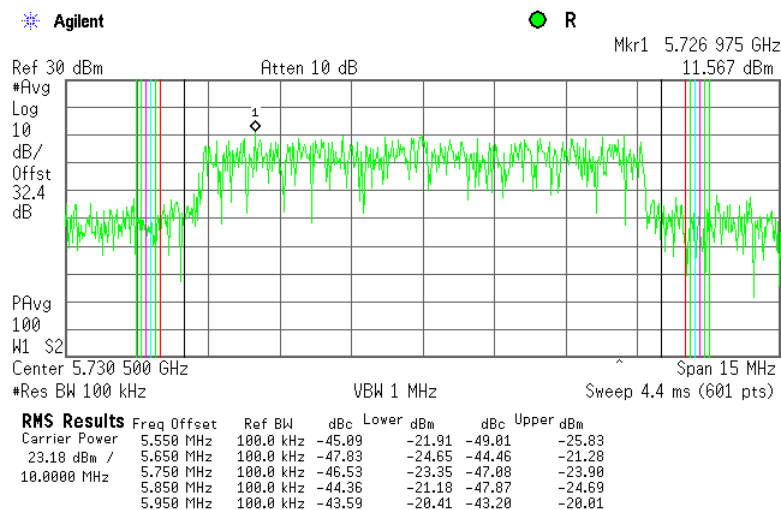
HERMON LABORATORIES

<b>Test specification:</b>		<b>FCC section 15.247(d), Band edge emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/12/2012	
<b>Temperature: 24 °C</b>		<b>Air Pressure: 1006 hPa</b>	
<b>Relative Humidity: 48 %</b>		<b>Power Supply: 48 VDC</b>	
<b>Remarks:</b>			
		<b>Verdict: PASS</b>	

Plot 7.5.13 The highest band edge emission at low carrier frequency, 10 MHz BW, QPSK modulation, Antenna 2



Plot 7.5.14 The highest band edge emission at low carrier frequency, 10 MHz BW, 64QAM modulation, Antenna 2

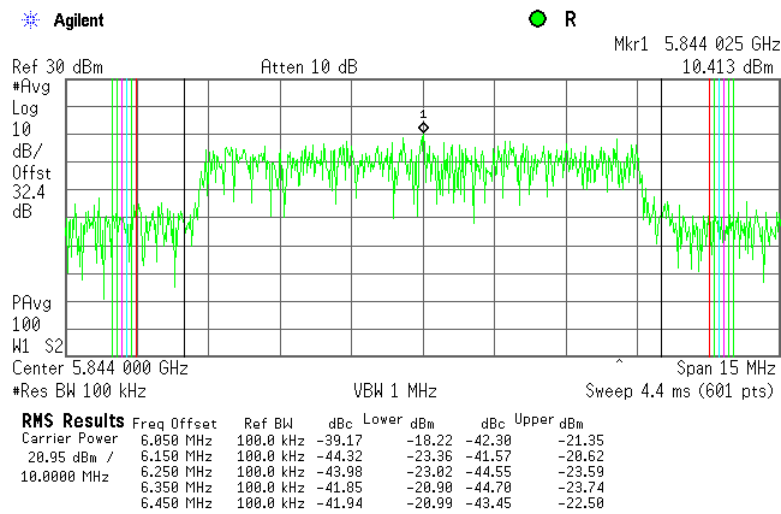




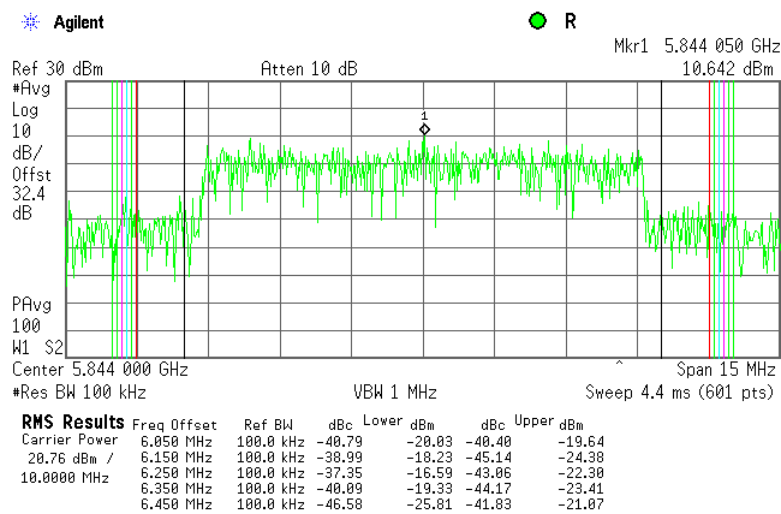
HERMON LABORATORIES

<b>Test specification:</b>		<b>FCC section 15.247(d), Band edge emissions</b>	
<b>Test procedure:</b>		558074 D01 DTS Meas Guidance v01	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/12/2012	
<b>Temperature:</b> 24 °C		<b>Air Pressure:</b> 1006 hPa	
		<b>Relative Humidity:</b> 48 %	
		<b>Power Supply:</b> 48 VDC	
<b>Remarks:</b>			
		<b>Verdict: PASS</b>	

Plot 7.5.15 The highest band edge emission at high carrier frequency, 10 MHz BW, QPSK modulation, Antenna 2



Plot 7.5.16 The highest band edge emission at high carrier frequency, 10 MHz BW, 64QAM modulation, Antenna 2





<b>Test specification:</b>		<b>Section 15.247(e), Peak power density</b>	
<b>Test procedure:</b>		ANSI C63.10-2009 section 6.11.2.4	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/12/2012	
<b>Temperature:</b> 24 °C		<b>Air Pressure:</b> 1008 hPa	
		<b>Relative Humidity:</b> 48 %	
		<b>Power Supply:</b> 48 VDC	
<b>Remarks:</b>			

## 7.6 Peak spectral power density

### 7.6.1 General

This test was performed to measure the peak spectral power density at the transmitter RF antenna connector. Specification test limits are given in Table 7.6.1.

Table 7.6.1 Peak spectral power density limits

Assigned frequency range, MHz	Measurement bandwidth, kHz	Peak spectral power density, dBm
5725-5850	3.0	8.0

### 7.6.2 Test procedure

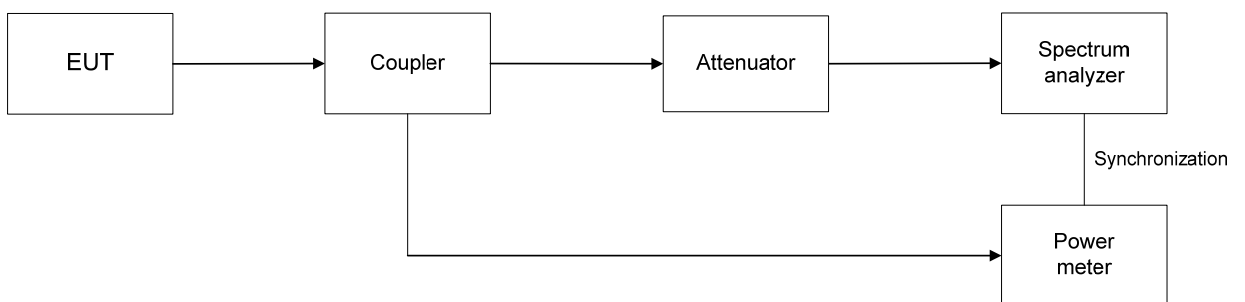
7.6.2.1 The EUT was set up as shown in Figure 7.6.1, energized and its proper operation was checked.

7.6.2.2 The EUT was adjusted to produce maximum available to end user RF output power.

7.6.2.3 The peak power spectral density was measured using a sample detector and power averaging mode with resolution bandwidth set to 3 kHz, video bandwidth wider than resolution bandwidth to find the highest level across the 100 sweeps of averaging.

7.6.2.4 The test results are provided in Table 7.6.2 and the associated plots.

Figure 7.6.1 Peak spectral power density test setup





<b>Test specification:</b>		<b>Section 15.247(e), Peak power density</b>	
<b>Test procedure:</b>		ANSI C63.10-2009 section 6.11.2.4	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/12/2012	
<b>Temperature:</b> 24 °C		<b>Air Pressure:</b> 1008 hPa	
		<b>Relative Humidity:</b> 48 %	
		<b>Power Supply:</b> 48 VDC	
<b>Remarks:</b>			

Table 7.6.2 Peak spectral power density test results

ASSIGNED FREQUENCY RANGE: 5725-5850 MHz  
 MODULATING SIGNAL: PRBS  
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum  
 DETECTOR USED: AVR  
 RESOLUTION BANDWIDTH: 3 kHz  
 VIDEO BANDWIDTH: 10 kHz  
 CHANNEL BANDWIDTH: 5 MHz

Carrier frequency, MHz	Peak power density at antenna 1, dBm/3 kHz	Total peak power density*, dBm/3 kHz	Limit, dBm/3 kHz	Margin*, dB	Verdict
QPSK					
5728.0	-1.61	1.39	8	-6.61	Pass
5787.5	-1.58	1.42	8	-6.58	Pass
5846.0	-0.03	2.97	8	-5.03	Pass
64 QAM					
5728.0	-0.44	2.56	8	-5.44	Pass
5787.5	-0.31	2.69	8	-5.31	Pass
5846.0	-0.42	2.58	8	-5.42	Pass

CHANNEL BANDWIDTH 10 MHz

Carrier frequency, MHz	Peak power density at antenna 1, dBm/3 kHz	Total peak power density*, dBm/3 kHz	Limit, dBm/3 kHz	Margin*, dB	Verdict
QPSK					
5730.5	-2.81	0.19	8	-7.81	Pass
5787.5	-3.08	-0.08	8	-8.08	Pass
5844.0	-4.09	-1.09	8	-9.09	Pass
64 QAM					
5730.5	-2.56	0.44	8	-7.56	Pass
5787.5	-3.00	0.00	8	-8.00	Pass
5844.0	-4.13	-1.13	8	-9.13	Pass

\*-Total peak power density = peak power density at antenna 1 + 10log (N), where N=2

\*\* - Margin, dB = Total peak power density – specification limit.

**Reference numbers of test equipment used**

HL 3301	HL 3302	HL 3442	HL 3781	HL 3868	HL 3903	HL 4355	
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Full description is given in Appendix A.

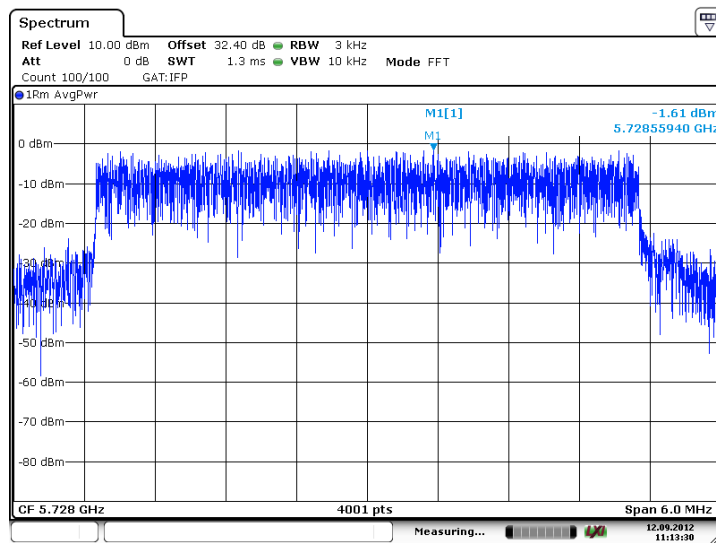


HERMON LABORATORIES

<b>Test specification:</b>		<b>Section 15.247(e), Peak power density</b>	
<b>Test procedure:</b>		ANSI C63.10-2009 section 6.11.2.4	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/12/2012	
<b>Temperature: 24 °C</b>		<b>Air Pressure: 1008 hPa</b>	
<b>Relative Humidity: 48 %</b>		<b>Power Supply: 48 VDC</b>	
<b>Remarks:</b>			
		<b>Verdict: PASS</b>	

Plot 7.6.1 Peak spectral power density at low frequency within 6 dB band

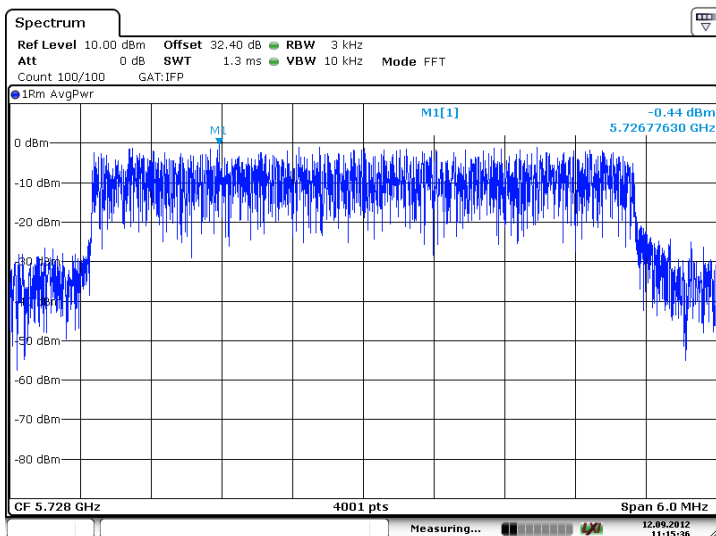
Emission Bandwidth	5 MHz
Modulation	QPSK



Date: 12.SEP.2012 11:13:30

Plot 7.6.2 Peak spectral power density at low frequency within 6 dB band

Emission Bandwidth	5 MHz
Modulation	64QAM



Date: 12.SEP.2012 11:15:36

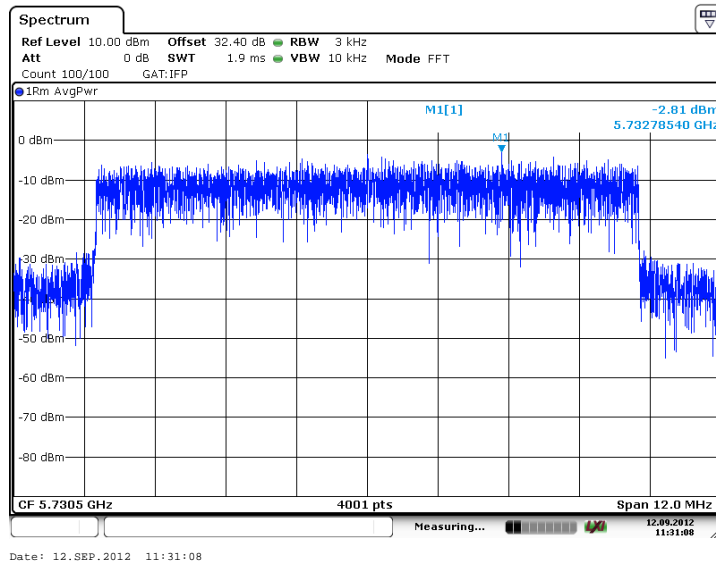


HERMON LABORATORIES

<b>Test specification:</b> Section 15.247(e), Peak power density	
<b>Test procedure:</b> ANSI C63.10-2009 section 6.11.2.4	
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b> 9/12/2012	
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa
	<b>Relative Humidity:</b> 48 %
	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>	

Plot 7.6.3 Peak spectral power density at low frequency within 6 dB band

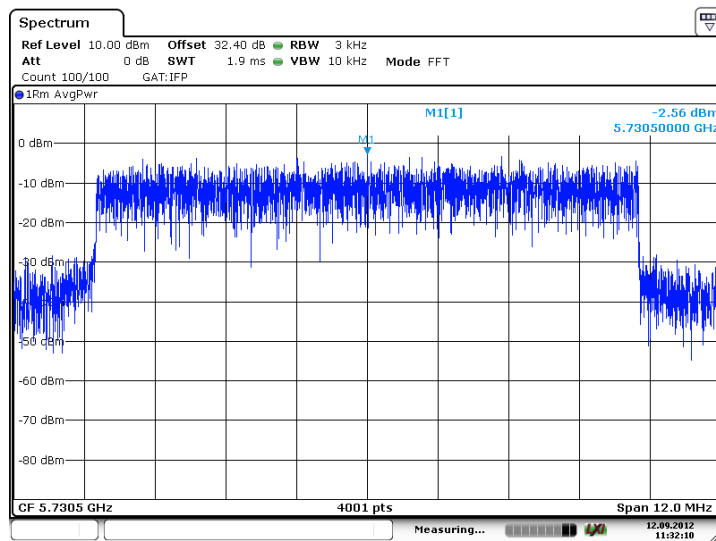
Emission Bandwidth	10 MHz
Modulation	QPSK



Date: 12.SEP.2012 11:31:08

Plot 7.6.4 Peak spectral power density at low frequency within 6 dB band

Emission Bandwidth	10MHz
Modulation	64 QAM



Date: 12.SEP.2012 11:32:10

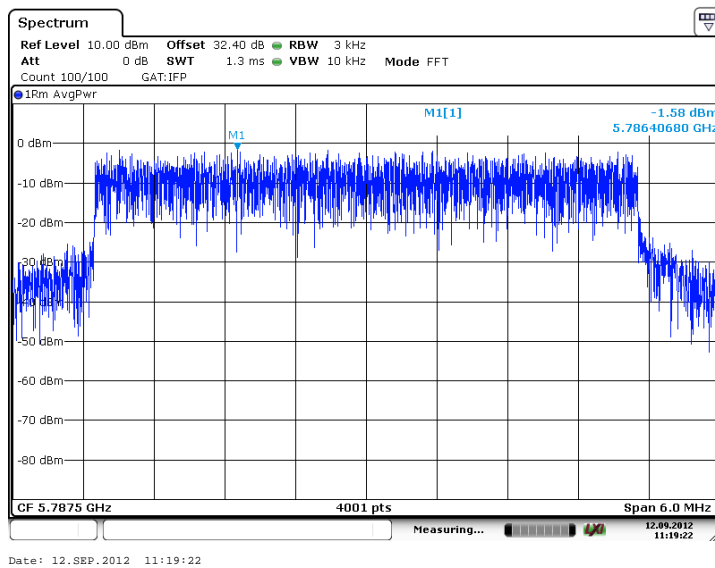


HERMON LABORATORIES

<b>Test specification:</b>		<b>Section 15.247(e), Peak power density</b>	
<b>Test procedure:</b>		ANSI C63.10-2009 section 6.11.2.4	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/12/2012	
<b>Temperature: 24 °C</b>		<b>Air Pressure: 1008 hPa</b>	
<b>Relative Humidity: 48 %</b>		<b>Power Supply: 48 VDC</b>	
<b>Remarks:</b>			
		<b>Verdict: PASS</b>	

Plot 7.6.5 Peak spectral power density at mid frequency within 6 dB band

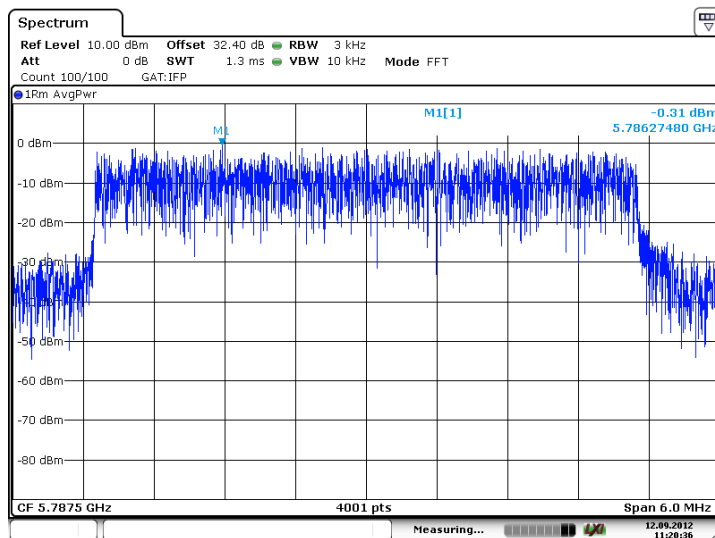
Emission Bandwidth	5 MHz
Modulation	QPSK



Date: 12.SEP.2012 11:19:22

Plot 7.6.6 Peak spectral power density at I mid frequency within 6 dB band

Emission Bandwidth	5 MHz
Modulation	64QAM



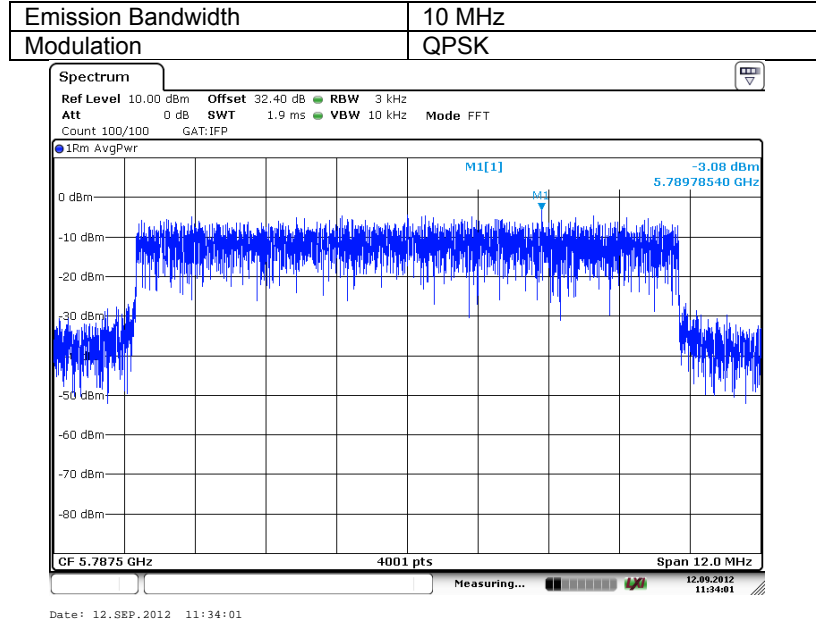
Date: 12.SEP.2012 11:20:36



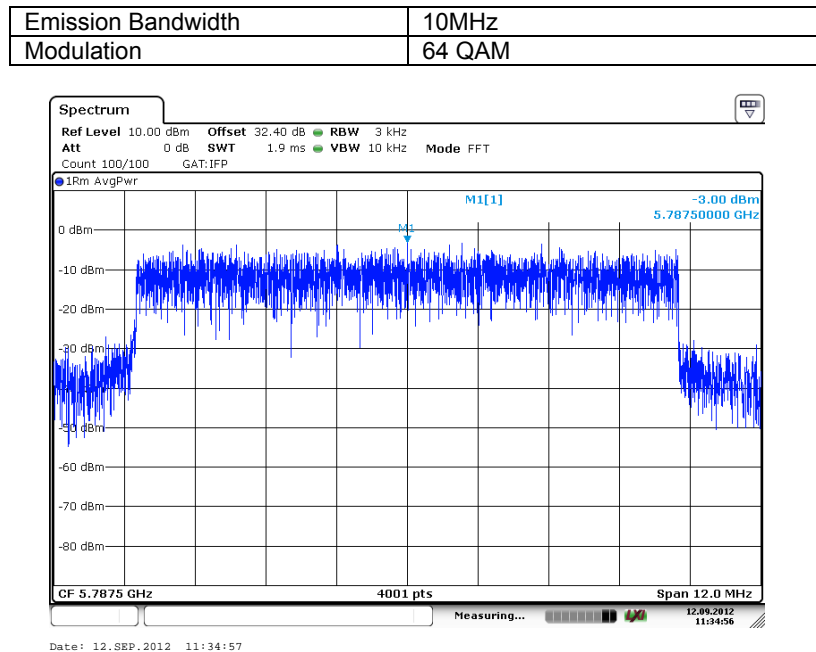
HERMON LABORATORIES

<b>Test specification:</b> Section 15.247(e), Peak power density			
<b>Test procedure:</b> ANSI C63.10-2009 section 6.11.2.4			
<b>Test mode:</b> Compliance			<b>Verdict:</b> PASS
<b>Date(s):</b> 9/12/2012			
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

Plot 7.6.7 Peak spectral power density at mid frequency within 6 dB band



Plot 7.6.8 Peak spectral power density at mid frequency within 6 dB band





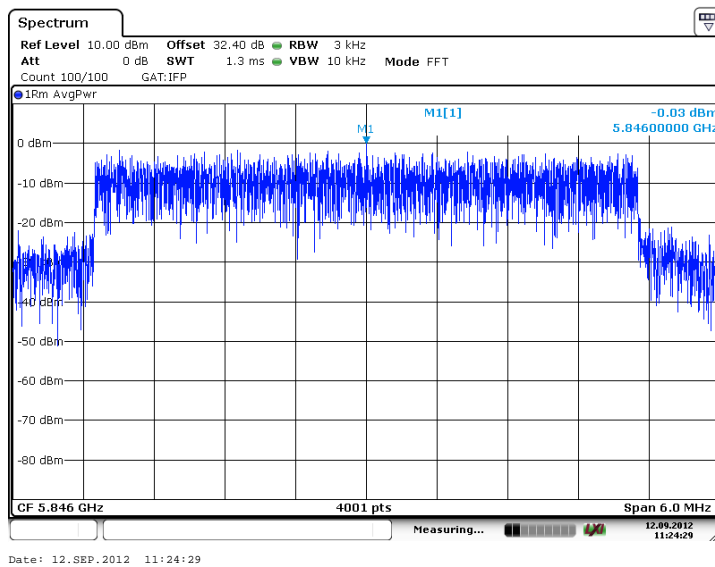


HERMON LABORATORIES

<b>Test specification:</b>		<b>Section 15.247(e), Peak power density</b>	
<b>Test procedure:</b>		ANSI C63.10-2009 section 6.11.2.4	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/12/2012	
<b>Temperature: 24 °C</b>		<b>Air Pressure: 1008 hPa</b>	
<b>Relative Humidity: 48 %</b>		<b>Power Supply: 48 VDC</b>	
<b>Remarks:</b>			
		<b>Verdict: PASS</b>	

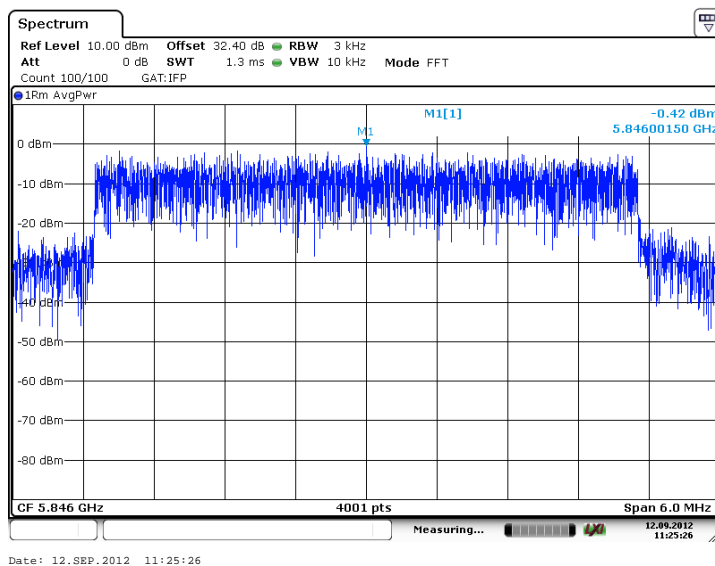
Plot 7.6.9 Peak spectral power density at high frequency within 6 dB band

Emission Bandwidth	5 MHz
Modulation	QPSK



Plot 7.6.10 Peak spectral power density at high frequency within 6 dB band

Emission Bandwidth	5 MHz
Modulation	64QAM



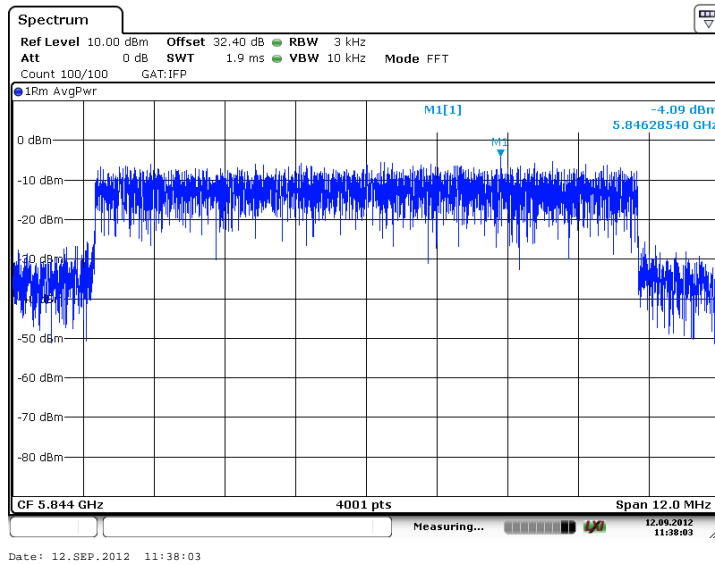


HERMON LABORATORIES

<b>Test specification:</b> Section 15.247(e), Peak power density			
<b>Test procedure:</b> ANSI C63.10-2009 section 6.11.2.4			
<b>Test mode:</b> Compliance	<b>Verdict:</b> PASS		
<b>Date(s):</b> 9/12/2012			
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1008 hPa	<b>Relative Humidity:</b> 48 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

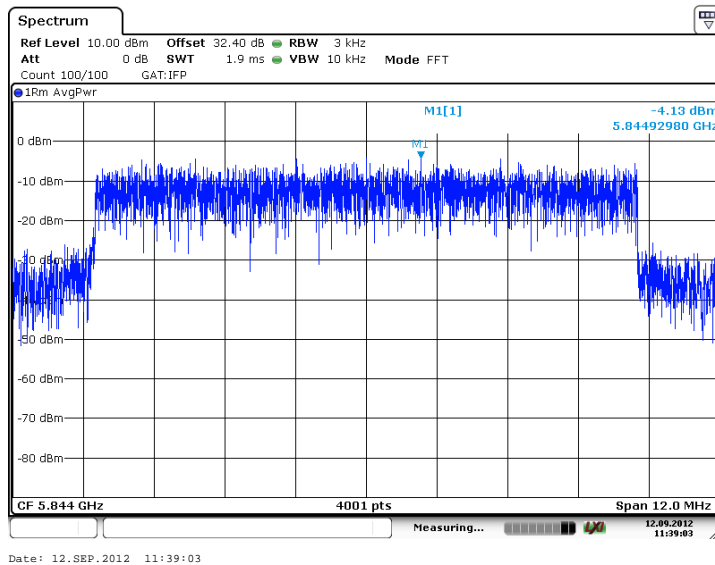
Plot 7.6.11 Peak spectral power density at high frequency within 6 dB band

Emission Bandwidth	10 MHz
Modulation	QPSK



Plot 7.6.12 Peak spectral power density at high frequency within 6 dB band

Emission Bandwidth	10MHz
Modulation	64 QAM





<b>Test specification:</b>		<b>Section 15.207(a), Conducted emission</b>	
<b>Test procedure:</b>		ANSI C63.4, Section 13.1.3	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/19/2012 - 9/23/2012	
<b>Temperature:</b> 24 °C		<b>Air Pressure:</b> 1009 hPa	
<b>Remarks:</b>		<b>Verdict:</b> PASS	
		<b>Relative Humidity:</b> 39 %	
		<b>Power Supply:</b> 120 VAC	

## 7.7 Conducted emissions

### 7.7.1 General

This test was performed to measure common mode conducted emissions at the power port. Specification test limits are given in Table 7.7.1.

Table 7.7.1 Limits for conducted emissions

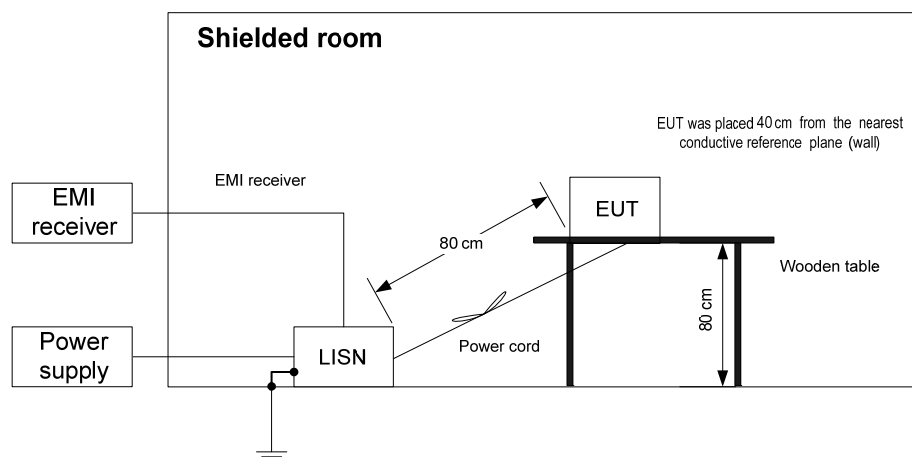
Frequency, MHz	Class B limit, dB(μV)	
	QP	AVRG
0.15 - 0.5	66 - 56*	56 - 46*
0.5 - 5.0	56	46
5.0 - 30	60	50

\* The limit decreases linearly with the logarithm of frequency.

### 7.7.2 Test procedure

- 7.7.2.1 The EUT was set up as shown in Figure 7.7.1 and associated photographs, energized and the performance check was conducted.
- 7.7.2.2 The measurements were performed at power terminals with the LISN, connected to a spectrum analyzer in the frequency range referred to in Table 7.7.2. Unused coaxial connector of the LISN was terminated with 50 Ohm. Quasi-peak and average detectors were used throughout the testing.
- 7.7.2.3 The position of the device cables was varied to determine maximum emission level.
- 7.7.2.4 The worst test results (the lowest margins) were recorded in Table 7.7.2 and shown in the associated plots.

Figure 7.7.1 Setup for conducted emission measurements, table-top equipment





<b>Test specification:</b>		<b>Section 15.207(a), Conducted emission</b>	
<b>Test procedure:</b>		ANSI C63.4, Section 13.1.3	
<b>Test mode:</b>		Compliance	
<b>Date(s):</b>		9/19/2012 - 9/23/2012	
<b>Temperature:</b> 24 °C		<b>Air Pressure:</b> 1009 hPa	
		<b>Relative Humidity:</b> 39 %	
		<b>Power Supply:</b> 120 VAC	
<b>Remarks:</b>			

Table 7.7.2 Conducted emission test results

LINE: AC mains  
 EUT OPERATING MODE: Transmit  
 EUT SET UP: TABLE-TOP with POE  
 TEST SITE: SHIELDED ROOM  
 DETECTORS USED: PEAK / QUASI-PEAK / AVERAGE  
 FREQUENCY RANGE: 150 kHz - 30 MHz  
 RESOLUTION BANDWIDTH: 9 kHz

Frequency, MHz	Peak emission, dB(μV)	Quasi-peak			Average			Line ID	Verdict
		Measured emission, dB(μV)	Limit, dB(μV)	Margin, dB*	Measured emission, dB(μV)	Limit, dB(μV)	Margin, dB*		
0.182340	59.11	57.46	64.42	-6.96	38.66	54.42	-15.76	L1	Pass
0.192305	58.89	57.75	63.95	-6.20	42.53	53.95	-11.42		
0.242930	50.37	49.34	62.00	-12.66	36.12	52.00	-15.88		
0.320680	44.26	43.37	59.72	-16.35	27.77	49.72	-21.95		
22.642505	50.81	47.99	60.00	-12.01	40.70	50.00	-9.30		
23.405728	52.91	50.95	60.00	-9.05	44.38	50.00	-5.62		
0.246690	48.43	45.97	61.89	-15.92	32.33	51.89	-19.56	L2	Pass
0.321645	42.58	41.79	59.70	-17.91	28.61	49.70	-21.09		
0.384595	39.41	37.86	58.20	-20.34	28.74	48.20	-19.46		
22.944445	51.98	49.41	60.00	-10.59	42.10	50.00	-7.90		
23.189945	51.27	48.17	60.00	-11.83	41.51	50.00	-8.49		
23.695568	52.69	49.97	60.00	-10.03	41.82	50.00	-8.18		

\*- Margin = Measured emission - specification limit.

Reference numbers of test equipment used

HL 0163	HL 0787	HL 1425	HL 1553	HL 3612			
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Full description is given in Appendix A.

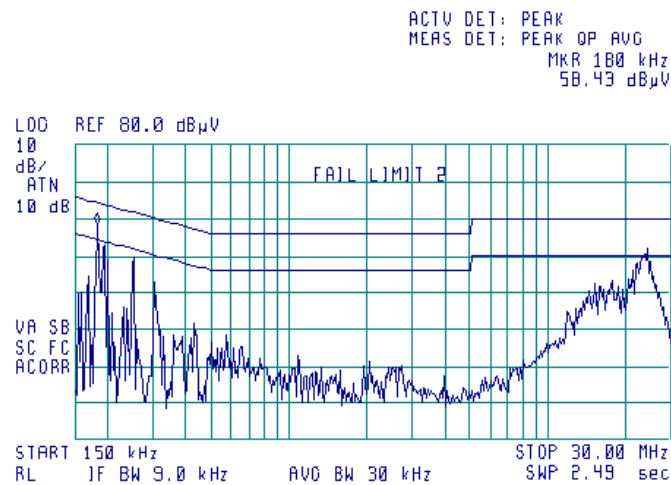


HERMON LABORATORIES

<b>Test specification:</b>	<b>Section 15.207(a), Conducted emission</b>		
<b>Test procedure:</b>	ANSI C63.4, Section 13.1.3		
<b>Test mode:</b>	Compliance	<b>Verdict:</b>	<b>PASS</b>
<b>Date(s):</b>	9/19/2012 - 9/23/2012		
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1009 hPa	<b>Relative Humidity:</b> 39 %	<b>Power Supply:</b> 120 VAC
<b>Remarks:</b>			

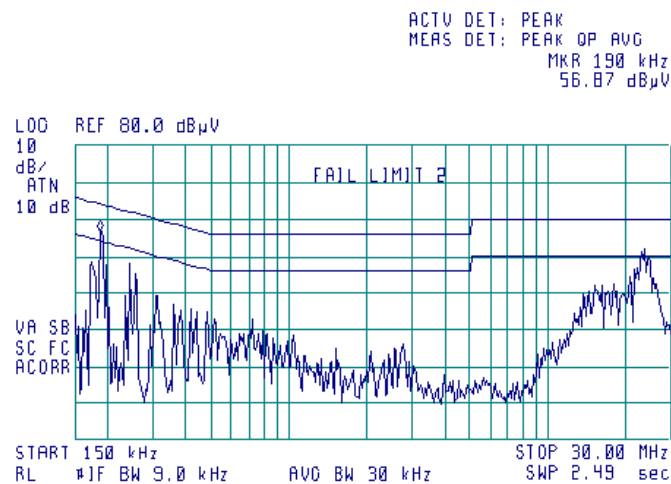
**Plot 7.7.1 Conducted emission measurements**

LINE: L1  
EUT OPERATING MODE: Transmit  
LIMIT: QUASI-PEAK, AVERAGE  
DETECTOR: PEAK



**Plot 7.7.2 Conducted emission measurements**

LINE: L2  
EUT OPERATING MODE: Transmit  
LIMIT: QUASI-PEAK, AVERAGE  
DETECTOR: PEAK





<b>Test specification:</b>	<b>FCC section 15.203, Antenna requirement</b>		
<b>Test procedure:</b>	Visual inspection		
<b>Test mode:</b>	Compliance	<b>Verdict:</b>	<b>PASS</b>
<b>Date(s):</b>	9/20/2012		
<b>Temperature:</b> 24 °C	<b>Air Pressure:</b> 1009 hPa	<b>Relative Humidity:</b> 39 %	<b>Power Supply:</b> 48 VDC
<b>Remarks:</b>			

### 7.8 Antenna requirements

The EUT was verified for compliance with antenna requirements. A transmitter shall be designed to ensure that no antenna other than that furnished by the responsible party will be used with the device. It may be either permanently attached or employs a unique antenna connector for every antenna proposed for use with the EUT. This requirement does not apply to professionally installed transmitters.

The rationale for compliance with the above requirements was either visual inspection results or supplier declaration. The summary of results is provided in Table 7.8.1.

Table 7.8.1 Antenna requirements

Requirement	Rationale	Verdict
The transmitter antenna is permanently attached	NA	Comply
The transmitter employs a unique antenna connector	Visual inspection	
The transmitter requires professional installation	NA	



## 8 APPENDIX A Test equipment and ancillaries used for tests

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal./ Check	Due Cal./ Check
0163	LISN FCC/VDE/50 Ohm/50 uH + 5 Ohm, MIL-STD-461E, CISPR 16-1	Electro-Metrics	ANS 25/2	1314	01-Jul-12	01-Jul-13
0446	Antenna, Loop, Active, 10 kHz - 30 MHz	EMCO	6502	2857	03-Jul-12	03-Jul-13
0521	EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-6.5 GHz	Hewlett Packard	8546A	3617A 00319, 3448A002 53	24-Sep-12	24-Sep-13
0604	Antenna BiconiLog Log-Periodic/T Bow-TIE, 26 - 2000 MHz	EMCO	3141	9611-1011	20-May-12	20-May-14
0768	Antenna Standard Gain Horn, 18-26.5 GHz, WR-42, 25 dB gain	Quinstar Technology	QWH-4200-BA	110	03-Feb-12	03-Feb-15
0769	Antenna Standard Gain Horn, 26.5-40 GHz, WR28, 25 dB gain	Quinstar Technology	QWH-2800-BA	112	03-Feb-12	03-Feb-15
0787	Transient Limiter 9 kHz-200 MHz	Hewlett Packard	11947A	3107A018 77	18-Oct-12	18-Oct-13
1425	EMI Receiver, 9 kHz - 2.9 GHz, System: HL1426, HL1427	Agilent Technologies	8542E	3710A002 22, 3705A002 04	26-Aug-12	26-Aug-13
1553	Cable RF, 3.5 m, N/N-type	Alpha Wire	RG-214	1553	01-Jan-12	01-Jan-13
2432	Antenna, Double-Ridged Waveguide Horn 1-18 GHz	EMC Test Systems	3115	00027177	25-Nov-11	25-Nov-12
2780	EMC analyzer, 100 Hz to 26.5 GHz	Agilent Technologies	E7405A	MY451024 62	09-Jul-12	09-Jul-13
2883	Cable, 18 GHz N-type, M-F, 3 m	Bird Electronic Corp.	TC-MNFN-3.0	211539 003	04-Dec-11	04-Dec-12
3301	Power Meter, P-series, 50 MHz to 40 GHz	Agilent Technologies	N1911A	MY451010 57	14-Dec-11	14-Dec-12
3302	Power sensor, P-Series, 50 MHz to 40 GHz, -35/30 to 20 dBm	Agilent Technologies	N1922A	MY452405 86	14-Dec-11	14-Dec-12
3347	High Pass Filter, 50 Ohm, 6000 to 11500 MHz.	Mini-Circuits	VHF-5500+	NA	02-Oct-11	02-Oct-13
3390	Microwave Cable Assembly, 26.5 GHz, 1.0 m, N type/N type	Suhner Sucoflex	104EA	3390	07-Feb-12	07-Feb-13
3442	Precision Fixed Attenuator, 50 Ohm, 5 W, 20 dB, DC to 18 GHz	Mini-Circuits	BW-S20W5+	NA	07-Mar-12	07-Mar-13
3473	Cable, Coax, Microwave, DC-18 GHz, SMA-SMA, 0.6 m	Gore	GORE 65474	1003478	09-May-12	09-May-13
3533	Amplifier, low noise, 6 to 18 GHz	Quinstar Technology	QLJ-06184040-J0	111590010 01	25-Dec-11	25-Dec-12
3535	Amplifier, low noise, 18 to 40 GHz	Quinstar Technology	QLJ-18404537-J0	111590030 01	10-Jul-12	10-Jul-13
3612	Cable RF, 17.5 m, N type-N type	Teldor	RG-214/U	NA	01-Dec-11	01-Dec-12
3781	Precision Fixed Attenuator, 50 Ohm, 5 W, 10 dB, DC to 18 GHz	Mini-Circuits	BW-S10W5+	NA	19-Dec-11	19-Dec-12
3786	Precision Fixed Attenuator, 50 Ohm, 5 W, 10 dB, DC to 18 GHz	Mini-Circuits	BW-S10W5+	NA	19-Dec-11	19-Dec-12
3818	PSA Series Spectrum Analyzer, 3 Hz- 44 GHz	Agilent Technologies	E4446A	MY482502 88	16-Feb-12	16-Feb-13
3868	Directional coupler, 2 GHz to 8 GHz, 10 dB, SMA Female	Narda	4203-10	06978	13-Dec-10	13-Dec-12



HL No	Description	Manufacturer	Model	Ser. No.	Last Cal./ Check	Due Cal./ Check
3901	Microwave Cable Assembly, 40.0 GHz, 3.5 m, SMA/SMA	Huber-Suhner	SUCOFLE X 102A	1225/2A	08-Feb-12	08-Feb-13
3903	Microwave Cable Assembly, 40.0 GHz, 1.5 m, SMA/SMA	Huber-Suhner	SUCOFLE X 102A	1226/2A	08-Feb-12	08-Feb-13
4342	High Pass Filter, 50 Ohm, 10.6 to 26.5 GHz, SMA-M / SMA-FM	RLC Electronics	F-5738A	8425	25-Mar-12	25-Mar-13
4355	Signal and Spectrum Analyzer, 9 kHz to 7 GHz, with Preamplifier 20 dB	Rohde & Schwarz	FSV 7	191000086881	08-Mar-12	08-Mar-13
4366	Directional coupler, 1 GHz to 18 GHz, 10 dB, SMA Female	Tiger Micro-Electronics Institute	TGD-A1101-10	01e-JSDE805-007	17-Apr-12	17-Apr-14





## 9 APPENDIX B Measurement uncertainties

### Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

Test description	Expanded uncertainty
Conducted carrier power at RF antenna connector	Below 12.4 GHz: $\pm 1.7$ dB 12.4 GHz to 40 GHz: $\pm 2.3$ dB
Conducted emissions at RF antenna connector	9 kHz to 2.9 GHz: $\pm 2.6$ dB 2.9 GHz to 6.46 GHz: $\pm 3.5$ dB 6.46 GHz to 13.2 GHz: $\pm 4.3$ dB 13.2 GHz to 22.0 GHz: $\pm 5.0$ dB 22.0 GHz to 26.8 GHz: $\pm 5.5$ dB 26.8 GHz to 40.0 GHz: $\pm 4.8$ dB
Occupied bandwidth	$\pm 8.0$ %
Duty cycle, timing (Tx ON / OFF) and average factor measurements	$\pm 1.0$ %
Conducted emissions with LISN	9 kHz to 150 kHz: $\pm 3.9$ dB 150 kHz to 30 MHz: $\pm 3.8$ dB
Radiated emissions at 3 m measuring distance Horizontal polarization  Vertical polarization	Biconilog antenna: $\pm 5.3$ dB Biconical antenna: $\pm 5.0$ dB Log periodic antenna: $\pm 5.3$ dB Double ridged horn antenna: $\pm 5.3$ dB Biconilog antenna: $\pm 6.0$ dB Biconical antenna: $\pm 5.7$ dB Log periodic antenna: $\pm 6.0$ dB Double ridged horn antenna: $\pm 6.0$ dB

Hermon Laboratories is accredited by A2LA for calibration according to present requirements of ISO/IEC 17025 and NCSL Z540-1. The accreditation is granted to perform calibration of parameters that are listed in the Scope of Hermon Laboratories Accreditation.

Hermon Laboratories calibrates its reference and transfer standards by calibration laboratories accredited to ISO/IEC 17025 by a mutually recognized Accreditation Body or by a recognized national metrology institute. All reference and transfer standards used in the calibration system are traceable to national or international standards.

In-house calibration of all test and measurement equipment is performed on a regular basis according to Hermon Laboratories calibration procedures, manufacturer calibration/verification procedures or procedures defined in the relevant standards. The Hermon Laboratories test and measurement equipment is calibrated within the tolerances specified by the manufacturers and/or by the relevant standards.

## 10 APPENDIX C Test laboratory description

Tests were performed at Hermon Laboratories Ltd., which is a fully independent, private, EMC, safety, environmental and telecommunication testing facility.

Hermon Laboratories is listed by the Federal Communications Commission (USA) for all parts of Code of Federal Regulations 47 (CFR 47), Registration Numbers 90624 for OATS and 90623 for the anechoic chamber; by Industry Canada for electromagnetic emissions (file numbers IC 2186A-1 for OATS, IC 2186A-2 for anechoic chamber, IC 2186A-3 for full-anechoic chamber for RE measurements above 1 GHz), certified by VCCI, Japan (the registration numbers are R-808 for OATS, R-1082 for anechoic chamber, G-27 for full-anechoic chamber for RE measurements above 1 GHz, C-845 for conducted emissions site, T-1606 for conducted emissions at telecommunication ports), has a status of a Telefication - Listed Testing Laboratory, Certificate No. L138/00. The laboratory is accredited by American Association for Laboratory Accreditation (USA) according to ISO/IEC 17025 for electromagnetic compatibility, product safety, telecommunications testing and environmental simulation (for exact scope please refer to Certificate No. 839.01). The FCC Designation Number is US1003.

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Person for contact: Mr. Alex Usoskin, CEO.

## 11 APPENDIX D Specification references

FCC 47CFR part 15: 2011	Radio Frequency Devices
558074 D01 DTS Meas Guidance v01, 1/18/2012	FCC Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247
ANSI C63.2: 1996	American National Standard for Instrumentation-Electromagnetic Noise and Field Strength, 10 kHz to 40 GHz-Specifications
ANSI C63.4: 2003	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI C63.10: 2009	American National Standard for Testing Unlicensed Wireless Devices



## 12 APPENDIX E Test equipment correction factors

**Correction factor  
Line impedance stabilization network  
Model ANS-25/2, Electro-Metrics, HL 0163**

Frequency, kHz	Correction factor, dB
10	4.9
15	2.86
20	1.83
25	1.25
30	0.91
35	0.69
40	0.53
50	0.35
60	0.25
70	0.18
80	0.14
90	0.11
100	0.09
125	0.06
150	0.04

The correction factor in dB is to be added to meter readings of an interference analyzer or a spectrum analyzer.



**Antenna factor**  
**Active loop antenna**  
**Model 6502, S/N 2857, HL 0446**

Frequency, MHz	Magnetic antenna factor, dB	Electric antenna factor, dB
0.009	-32.8	18.7
0.010	-33.8	17.7
0.020	-38.3	13.2
0.050	-41.1	10.4
0.075	-41.3	10.2
0.100	-41.6	9.9
0.150	-41.7	9.8
0.250	-41.6	9.9
0.500	-41.8	9.8
0.750	-41.9	9.7
1.000	-41.4	10.1
2.000	-41.5	10.0
3.000	-41.4	10.2
4.000	-41.4	10.1
5.000	-41.5	10.1
10.000	-41.9	9.6
15.000	-41.9	9.6
20.000	-42.2	9.3
25.000	-42.8	8.7
30.000	-44.0	7.5

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB( $\mu$ V) to convert it into field intensity in dB( $\mu$ V/m).

**Antenna factor**  
**Standard gain horn antenna**  
**Quinstar Technology**  
**Model QWH**  
**Ser.No.112, HL 0768, HL 0769**

Frequency min, GHz	Frequency max, GHz	Antenna factor, dB(1/m)
18.000	26.500	32.01
26.500	40.000	35.48
40.000	60.000	39.03
60.000	90.000	42.55
90.000	140.000	46.23
140.000	220.000	50.11

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB( $\mu$ V) to convert it into field strength in dB( $\mu$ V/m).



Antenna factor  
Biconilog antenna EMCO Model 3141  
Ser.No.1011, HL 0604

Frequency, MHz	Antenna factor, dB(1/m)	Frequency, MHz	Antenna factor, dB(1/m)	Frequency, MHz	Antenna factor, dB(1/m)
26	7.8	580	20.6	1320	27.8
28	7.8	600	21.3	1340	28.3
30	7.8	620	21.5	1360	28.2
40	7.2	640	21.2	1380	27.9
60	7.1	660	21.4	1400	27.9
70	8.5	680	21.9	1420	27.9
80	9.4	700	22.2	1440	27.8
90	9.8	720	22.2	1460	27.8
100	9.7	740	22.1	1480	28.0
110	9.3	760	22.3	1500	28.5
120	8.8	780	22.6	1520	28.9
130	8.7	800	22.7	1540	29.6
140	9.2	820	22.9	1560	29.8
150	9.8	840	23.1	1580	29.6
160	10.2	860	23.4	1600	29.5
170	10.4	880	23.8	1620	29.3
180	10.4	900	24.1	1640	29.2
190	10.3	920	24.1	1660	29.4
200	10.6	940	24.0	1680	29.6
220	11.6	960	24.1	1700	29.8
240	12.4	980	24.5	1720	30.3
260	12.8	1000	24.9	1740	30.8
280	13.7	1020	25.0	1760	31.1
300	14.7	1040	25.2	1780	31.0
320	15.2	1060	25.4	1800	30.9
340	15.4	1080	25.6	1820	30.7
360	16.1	1100	25.7	1840	30.6
380	16.4	1120	26.0	1860	30.6
400	16.6	1140	26.4	1880	30.6
420	16.7	1160	27.0	1900	30.6
440	17.0	1180	27.0	1920	30.7
460	17.7	1200	26.7	1940	30.9
480	18.1	1220	26.5	1960	31.2
500	18.5	1240	26.5	1980	31.6
520	19.1	1260	26.5	2000	32.0
540	19.5	1280	26.6		
560	19.8	1300	27.0		

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μV) to convert it into field strength in dB(μV/m).



**Antenna factor**  
**Double-ridged guide horn antenna**  
**Model 3115, serial number: 00027177, HL 2432**

Frequency, MHz	Antenna factor. dB(1/m)
1000.0	24.7
1500.0	25.7
2000.0	27.8
2500.0	28.9
3000.0	30.7
3500.0	31.8
4000.0	33.0
4500.0	32.8
5000.0	34.2
5500.0	34.9
6000.0	35.2
6500.0	35.4
7000.0	36.3
7500.0	37.3
8000.0	37.5
8500.0	38.0
9000.0	38.3
9500.0	38.3
10000.0	38.7
10500.0	38.7
11000.0	38.9
11500.0	39.5
12000.0	39.5
12500.0	39.4
13000.0	40.5
13500.0	40.8
14000.0	41.5
14500.0	41.3
15000.0	40.2
15500.0	38.7
16000.0	38.5
16500.0	39.8
17000.0	41.9
17500.0	45.8
18000.0	49.1

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB( $\mu$ V) to convert it into field strength in dB( $\mu$ V/m).



**Cable loss**  
**RF cable 3.5 m, Alpha Wire, model RG-214, S/N 149, HL 1553**

No.	Frequency, MHz	Cable loss, dB	Measurement uncertainty, dB
1	1	0.01	±0.05
2	10	0.07	
3	30	0.12	
4	50	0.22	
5	100	0.26	
6	200	0.40	
7	300	0.52	
8	400	0.60	
9	500	0.70	
10	600	0.77	
11	700	0.84	
12	800	1.00	
13	900	1.00	
14	1000	1.05	
15	2000	1.70	



**Cable loss**  
**Cable coaxial, Bird, 18 GHz, N-type, M-F, model TC-MNFN-3.0, S/N 211539 003**  
**HL 2883**

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.06	5750	1.70	12000	2.46
30	0.12	6000	1.75	12250	2.48
100	0.21	6250	1.80	12500	2.52
250	0.34	6500	1.81	12750	2.50
500	0.47	6750	1.86	13000	2.54
750	0.59	7000	1.86	13250	2.48
1000	0.67	7250	1.92	13500	2.63
1250	0.76	7500	1.96	13750	2.65
1500	0.84	7750	1.98	14000	2.72
1750	0.92	8000	2.02	14250	2.67
2000	0.98	8250	2.03	14500	2.70
2250	1.05	8500	2.05	14750	2.72
2500	1.12	8750	2.11	15000	2.79
2750	1.17	9000	2.17	15250	2.80
3000	1.22	9250	2.17	15500	2.83
3250	1.27	9500	2.20	15750	2.75
3500	1.33	9750	2.19	16000	2.82
3750	1.38	10000	2.22	16250	2.85
4000	1.42	10250	2.25	16500	2.90
4250	1.46	10500	2.30	16750	2.89
4500	1.51	10750	2.28	17000	2.88
4750	1.54	11000	2.32	17250	2.85
5000	1.59	11250	2.34	17500	2.96
5250	1.62	11500	2.39	17750	3.04
5500	1.65	11750	2.42	18000	3.04





**Cable loss**  
**Cable coaxial, Microwave Cable Assembly, 104EA, 18 GHz, 1.0 m**  
**Suhner Sucoflex, HL 3390**

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.03	4800	0.55	9800	0.89	14900	1.07
30	0.04	4900	0.56	9900	0.89	15000	1.07
50	0.05	5000	0.57	10000	0.86	15100	1.08
100	0.07	5100	0.58	10100	0.86	15200	1.07
200	0.10	5200	0.58	10200	0.88	15300	1.09
300	0.12	5300	0.59	10300	0.92	15400	1.10
400	0.14	5400	0.59	10400	0.94	15500	1.10
500	0.16	5500	0.60	10500	0.96	15600	1.12
600	0.17	5600	0.61	10600	0.93	15700	1.15
700	0.18	5700	0.61	10700	0.89	15800	1.15
800	0.20	5800	0.63	10800	0.89	15900	1.17
900	0.21	5900	0.63	10900	0.88	16000	1.14
1000	0.23	6000	0.64	11000	0.92	16100	1.14
1100	0.24	6100	0.64	11100	0.91	16200	1.15
1200	0.25	6200	0.64	11200	0.89	16300	1.14
1300	0.27	6300	0.65	11300	0.88	16400	1.13
1400	0.28	6400	0.65	11400	0.88	16500	1.13
1500	0.28	6500	0.66	11500	0.90	16600	1.13
1600	0.30	6600	0.67	11600	0.94	16700	1.14
1700	0.31	6700	0.67	11700	0.96	16800	1.14
1800	0.32	6800	0.67	11800	0.92	16900	1.14
1900	0.33	6900	0.68	11900	0.92	17000	1.14
2000	0.34	7000	0.67	12000	0.91	17100	1.15
2100	0.35	7100	0.68	12100	0.92	17200	1.14
2200	0.35	7200	0.69	12200	0.95	17300	1.15
2300	0.36	7300	0.69	12300	0.98	17400	1.15
2400	0.37	7400	0.68	12400	0.96	17500	1.16
2500	0.39	7500	0.69	12500	0.99	17600	1.16
2600	0.40	7600	0.70	12600	0.96	17700	1.16
2700	0.41	7700	0.71	12700	0.93	17800	1.19
2800	0.42	7800	0.72	12800	0.94	17900	1.21
2900	0.42	7900	0.72	12900	0.98	18000	1.25
3000	0.43	8000	0.72	13000	0.99		
3100	0.44	8100	0.73	13100	0.99		
3200	0.45	8200	0.74	13200	0.99		
3300	0.46	8300	0.75	13300	0.99		
3400	0.46	8400	0.74	13400	1.00		
3500	0.47	8500	0.73	13500	1.02		
3600	0.47	8600	0.73	13600	1.05		
3700	0.47	8700	0.75	13700	1.03		
3800	0.49	8800	0.77	13800	1.02		
3900	0.49	8900	0.77	13900	1.03		
4000	0.50	9000	0.77	14000	1.03		
4100	0.51	9100	0.77	14100	1.05		
4200	0.52	9200	0.78	14200	1.05		
4300	0.52	9300	0.80	14300	1.04		
4400	0.53	9400	0.82	14400	1.03		
4500	0.53	9500	0.82	14600	1.06		
4600	0.54	9600	0.83	14700	1.07		
4700	0.56	9700	0.89	14800	1.08		



**Cable loss**  
**Cable coaxial, Microwave, SMA-SMA, 18 GHz, 0.6 m**  
**Gore, HL 3473**

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.01	5000	0.48	10200	0.72	15500	0.85
30	0.03	5100	0.48	10300	0.70	15600	0.93
50	0.04	5200	0.48	10400	0.75	15700	0.87
100	0.04	5300	0.48	10500	0.68	15800	0.88
200	0.08	5400	0.50	10600	0.77	15900	0.94
300	0.11	5500	0.48	10700	0.80	16000	0.94
400	0.12	5600	0.50	10800	0.77	16100	0.99
500	0.13	5700	0.50	10900	0.85	16200	0.96
600	0.15	5800	0.52	11000	0.83	16300	0.96
700	0.15	5900	0.51	11100	0.79	16400	0.94
800	0.17	6000	0.52	11200	0.82	16500	0.94
900	0.19	6100	0.54	11300	0.79	16600	1.03
1000	0.18	6200	0.53	11400	0.81	16700	1.04
1100	0.20	6300	0.54	11500	0.76	16800	1.07
1200	0.22	6400	0.55	11600	0.78	16900	0.94
1300	0.22	6500	0.56	11700	0.74	17000	1.05
1400	0.23	6600	0.56	11800	0.76	17100	0.96
1500	0.24	6700	0.60	11900	0.79	17200	1.07
1600	0.25	6800	0.55	12000	0.74	17300	0.98
1700	0.25	6900	0.60	12100	0.69	17400	1.16
1800	0.26	7000	0.59	12200	0.69	17500	1.05
1900	0.27	7100	0.60	12300	0.75	17600	1.13
2000	0.29	7200	0.61	12400	0.66	17700	1.05
2100	0.28	7300	0.60	12500	0.76	17800	1.22
2200	0.30	7400	0.57	12600	0.70	17900	1.02
2300	0.30	7500	0.63	12700	0.77	18000	1.04
2400	0.31	7600	0.60	12800	0.69		
2500	0.31	7700	0.63	12900	0.79		
2600	0.33	7800	0.66	13000	0.81		
2700	0.33	7900	0.61	13100	0.83		
2800	0.35	8000	0.58	13200	0.80		
2900	0.35	8100	0.62	13300	0.82		
3000	0.35	8200	0.62	13400	0.90		
3100	0.35	8300	0.63	13500	0.85		
3200	0.36	8400	0.67	13600	1.04		
3300	0.38	8500	0.63	13700	0.93		
3400	0.38	8600	0.61	13800	0.91		
3500	0.40	8700	0.64	13900	0.89		
3600	0.40	8800	0.62	14000	0.96		
3700	0.40	8900	0.64	14100	0.88		
3800	0.41	9000	0.64	14200	1.01		
3900	0.41	9100	0.64	14300	0.99		
4000	0.41	9200	0.63	14400	0.83		
4100	0.45	9300	0.63	14600	0.88		
4200	0.43	9400	0.63	14700	0.91		
4300	0.46	9500	0.64	14800	0.91		
4400	0.44	9600	0.65	14900	0.88		
4500	0.47	9700	0.62	15000	0.89		
4600	0.46	9800	0.66	15100	0.91		
4700	0.47	9900	0.61	15200	0.88		
4800	0.47	10000	0.70	15300	0.94		
4900	0.48	10100	0.70	15400	0.91		



**Cable loss**  
**Cable coaxial, RG-214/U, N type-N type, 17 m**  
**Teldor, HL 3612**

Frequency, MHz	Cable loss, dB
0.1	0.05
0.5	0.07
1	0.10
3	0.22
5	0.29
10	0.39
30	0.68
50	0.90
100	1.27
150	1.58
200	1.80
250	2.12
300	2.36
350	2.60
400	2.82
450	2.99
500	3.23
550	3.40
600	3.56
650	3.71
700	3.90
750	4.04
800	4.23
850	4.39
900	4.55
950	4.65
1000	4.79



**Cable loss**  
**Microwave Cable Assembly, Huber-Suhner, 40 GHz, 3.5 m, SMA-SMA, S/N 1225/2A**  
**HL 3901**

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.09	9500	4.29	21000	6.67
100	0.41	10000	4.40	22000	6.92
500	0.93	10500	4.52	23000	7.00
1000	1.33	11000	4.64	24000	7.18
1500	1.63	11500	4.76	25000	7.29
2000	1.90	12000	4.87	26000	7.55
2500	2.12	12500	4.99	27000	7.70
3000	2.33	13000	5.11	28000	7.88
3500	2.50	13500	5.20	29000	8.02
4000	2.67	14000	5.31	30000	8.15
4500	2.82	14500	5.42	31000	8.35
5000	2.99	15000	5.51	32000	8.40
5500	3.16	15500	5.58	33000	8.62
6000	3.32	16000	5.68	34000	8.73
6500	3.51	16500	5.78	35000	8.78
7000	3.65	17000	5.91	36000	8.94
7500	3.79	17500	5.99	37000	9.21
8000	3.92	18000	6.07	38000	9.37
8500	4.04	19000	6.36	39000	9.45
9000	4.18	20000	6.49	40000	9.52



**Cable loss**  
**Microwave Cable Assembly, Huber-Suhner, 40 GHz, 1.5 m, SMA-SMA, S/N 1226/2A**  
**HL 3903**

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	-0.02	9500	1.84	21000	2.98
100	0.15	10000	1.86	22000	3.07
500	0.38	10500	1.93	23000	3.13
1000	0.56	11000	1.99	24000	3.21
1500	0.69	11500	2.04	25000	3.26
2000	0.82	12000	2.10	26000	3.48
2500	0.90	12500	2.15	27000	3.44
3000	0.98	13000	2.21	28000	3.53
3500	1.06	13500	2.25	29000	3.59
4000	1.11	14000	2.29	30000	3.66
4500	1.17	14500	2.34	31000	3.70
5000	1.24	15000	2.36	32000	3.79
5500	1.32	15500	2.40	33000	3.88
6000	1.40	16000	2.45	34000	3.94
6500	1.50	16500	2.48	35000	3.91
7000	1.56	17000	2.56	36000	4.05
7500	1.62	17500	2.58	37000	4.22
8000	1.68	18000	2.60	38000	4.25
8500	1.74	19000	2.84	39000	4.27
9000	1.78	20000	2.88	40000	4.33

## 13 APPENDIX F Abbreviations and acronyms

A	ampere
AC	alternating current
A/m	ampere per meter
AM	amplitude modulation
AVRG	average (detector)
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dB( $\mu$ V)	decibel referred to one microvolt
dB( $\mu$ V/m)	decibel referred to one microvolt per meter
dB( $\mu$ A)	decibel referred to one microampere
DC	direct current
EIRP	equivalent isotropically radiated power
ERP	effective radiated power
EUT	equipment under test
F	frequency
GHz	gigahertz
GND	ground
H	height
HL	Hermon laboratories
Hz	hertz
k	kilo
kHz	kilohertz
LO	local oscillator
m	meter
MHz	megahertz
min	minute
mm	millimeter
ms	millisecond
$\mu$ s	microsecond
NA	not applicable
NB	narrow band
OATS	open area test site
$\Omega$	Ohm
PM	pulse modulation
PS	power supply
ppm	part per million ( $10^{-6}$ )
QP	quasi-peak
RE	radiated emission
RF	radio frequency
rms	root mean square
Rx	receive
s	second
T	temperature
Tx	transmit
V	volt
WB	wideband

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